(NASA-CR-183609) CONJUGATING BINARY SYSTEMS FOR SPACECRAFT THERMAL CONTROL. APPENDIX C: AEROASSIST FLIGHT EXPERIMENT CARRIER VEHICLE PRELIMINARY STRESS ANALYSIS Final Report (Lockheed Missiles and Space Co.) 426 p
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# MARGIN OF SAFETY SUMMARY

| STRUCTURAL COMPONENT | MARGIN OF SAFETY | FAILURE MODE | PAGE NO. |
|---|---|---|---|
| AEROBRAKE ATTACH FITTINGS | | | |
| CV FITTING | .88 (U)<br>HIGH (Y) | BENDING | 5.1.7 |
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| UPPER BRACKET - FLANGES | .48 (U)<br>1.69 (Y) | CRIPPLING | 5.2.8 |
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| CYLINDER PANELS AT SRM BKTS | | | |
| BAY 1<br>BAY 3<br>BAY 5 | .29(U)<br>.00(U)<br>.02(U) | SHEAR-BUCKLING<br>SHEAR-BUCKLING<br>SHEAR BUCKLING | 5.2.21<br>5.2.22<br>5.2.20 |
| THRUSTER SUPPORT BEAMS | HIGH | BENDING - CRIPPLING | 5.3.6 |
| TRUNNION FITTING BACK UP STRUCTURE | | | |
| SUPPORT BEAM CHANNELS | -.42 (U)<br>-.25 (Y) | BENDING | 5.4.7 |

## MARGIN OF SAFETY SUMMARY (CONT'D)

| STRUCTURAL COMPONENT | MARGIN OF SAFETY | FAILURE MODE | PAGE NO. |
|---|---|---|---|
| UPPER AND LOWER ISOGRID PANELS | (SEE SUMMARY TABLE FOR ISOGRID BARS IN SECTION5.5) | | |
| CYLINDER RINGS | | | |
| TOP RING ANGLE | .48 (U) | BENDING | 5.6.7 |
| BOTTOM RING ANGLE | .15 (U) | BENDING | 5.6.9 |
| ISOGRID PANEL SPLICES | (SEE SUMMARY TABLE IN SECTION 5.7) | | |

# AFE CARRIER VEHICLE STRESS ANALYSIS

## 1.0 INTRODUCTION

This report presents the assessment of the static strength of the Aeroassist Flight Experiment (AFE) Carrier Vehicle structure. The Carrier Vehicle is the structural component which provides the mounting platform for the experiments, on-board computers, batteries and other "black boxes". In addition, the Solid Rocket Motor (SRM), the Thrusters, and the Aerobrake are all attached directly to the Carrier Vehicle.

The basic approach used in this analysis was to develop a NASTRAN Finite Element Model as a parallel effort to the preliminary design, and to use the internal loads from this model to perform the stress analysis. The loads on the Carrier Vehicle stem from several sources, principally, g forces on the components mounted to the Carrier Vehicle while the AFE is still supported in the Shuttle Payload Bay. The greatest load factors are due to Liftoff and Landing Abort conditions, during which the AFE is supported at the SRM. Because the design loads are given in terms of accelerations at the AFE CG, and because no aerodynamic loads are present on the aerobrake (during these conditions), it has been convenient to use a method of analysis in NASTRAN known as Inertial Relief. This method involves either specifying a set of CG accelerations or applying forces at the CG and representing the Carrier Vehicle and all of its mounted devices with the proper stiffness and mass properties. The masses will produce forces at their attach points in proportion to the accelerations of the total system. This procedure obviously depends upon an accurate representation of the mass properties of the entire AFE. A major advantage to this technique is that once the mass properties have been satisfactorily modeled, they remain the same for each load condition. New loads may be run on the model by simply applying forces to the CG rather than deriving a new set of forces for all of the separate components.

The regular landing condition is also an inertial relief solution because it, like liftoff and landing abort, has no aerodynamic loading. However it differs from the previous conditions in that the supports

which react the forces due to acceleration are at the Trunnion points rather than at the SRM Support Ring.

The mass properties of the total AFE model were developed by using structural mass for the Carrier Vehicle elements; i.e., NASTRAN will use the element section properties and the density specified on the MAT (material data) card to calculate the total mass and inertia of the structure. The non-Carrier Vehicle masses (mounted components, SRM, Aerobrake) were represented in the model as concentrated masses located at the component CG. The NASTRAN bulk data for the AFE model is included as Appendix A for reference.

In conducting the strength evaluation of the Carrier Vehicle using the output from the NASTRAN model, it became necessary to develop a post processing computer program to read the output isogrid bar forces and calculate margins of safety. The summary of isogrid margins of safety printed by this program are included in section 5.5 of this report. The listing of this FORTRAN program "ISOGRD" is also given as Appendix B.

## 2.0 STRUCTURAL DESCRIPTION

The Carrier Vehicle is currently designed as an all aluminum (2219-T87) bolted structure. The upper and lower panels are isogrid construction featuring a simple rectangular cross-section .07" x .50" for each individual isogrid bar. While the Carrier Vehicle is basically hexagonal in planform, and the panels in each bay are shaped the same, most of the panels have some feature that makes it unique. Each unique panel is given in Figures 2.5 through 2.12 which follow. The center cylinder, the avionics panels and the radial beams are all solid sections.

The panels and cylinder are attached using tee and angle sections as splicing members. These sections are shown along with the radial Beam details in Figures 2.13 and 2.14.

Figures 2.15 through 2.18 show the several fittings that provide the load path from the SRM to the Carrier Vehicle and from the Aerobrake to the Carrier Vehicle. These parts with the exception of the connecting pins/bolts are also 2219-T87 aluminum.

## 2.0 STRUCTURAL DESCRIPTION (CONT'D)

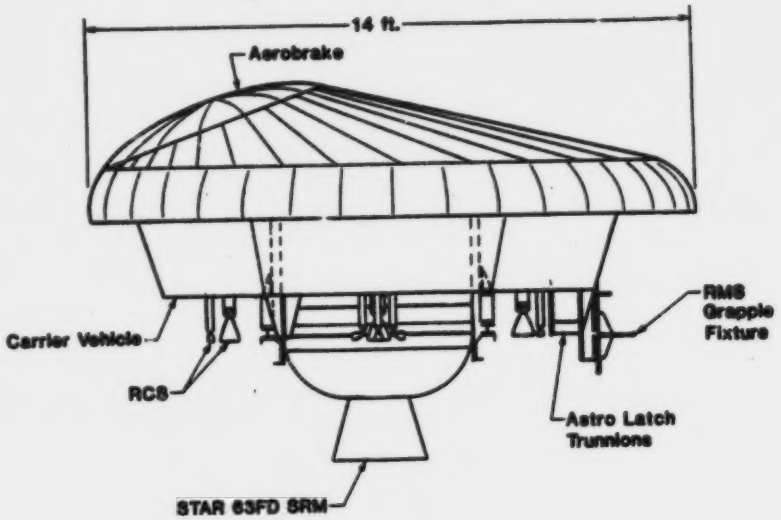


FIGURE 2.1 AEROASSIST FLIGHT EXPERIMENT REFERENCE CONFIGURATION

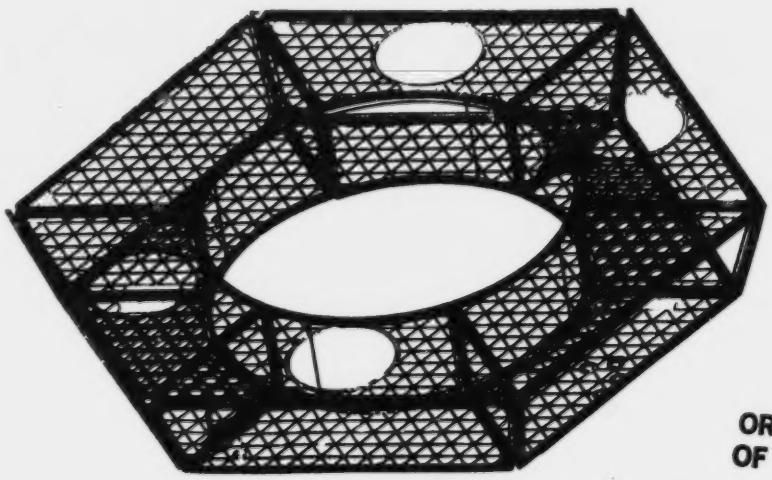

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FIGURE 2.2 AFE CARRIER VEHICLE STRUCTURE

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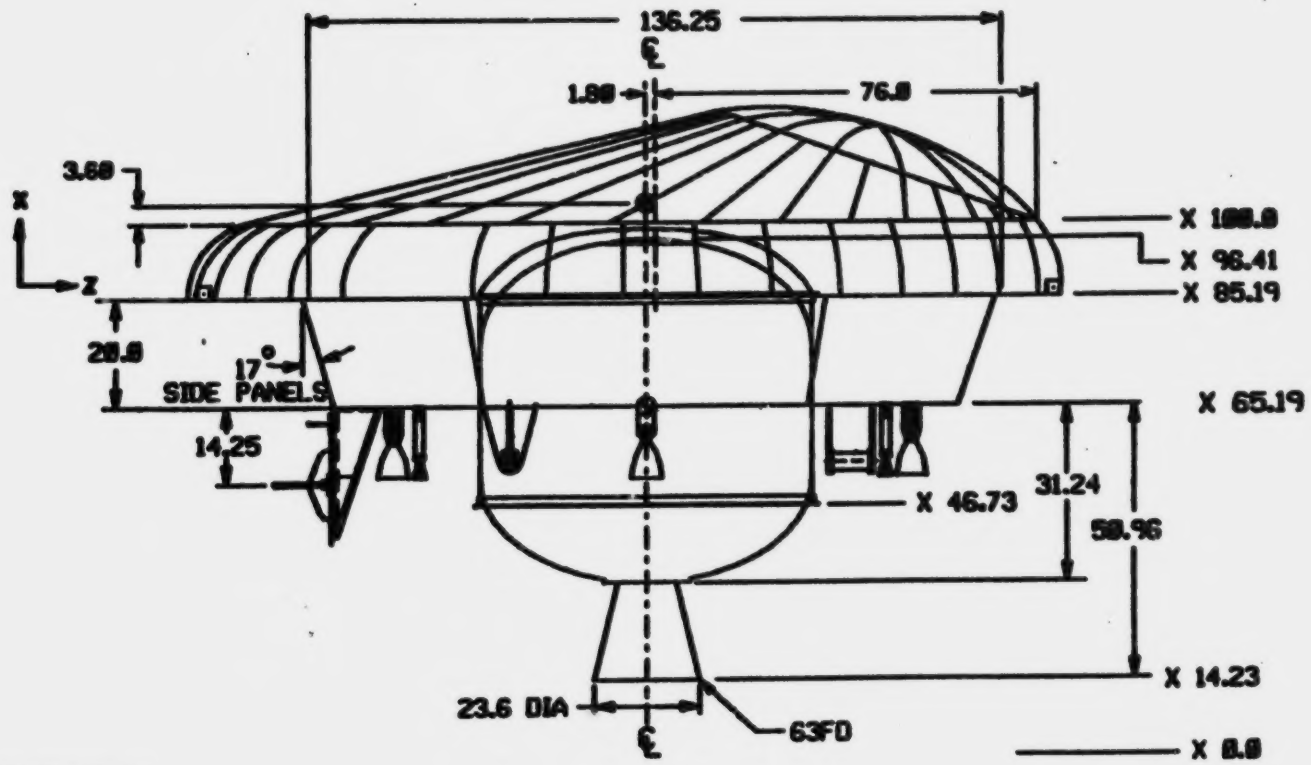
FIG 2.3 AFE COMPLETE - SIDE VIEW

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| Approved by: | Date | | Report No. |

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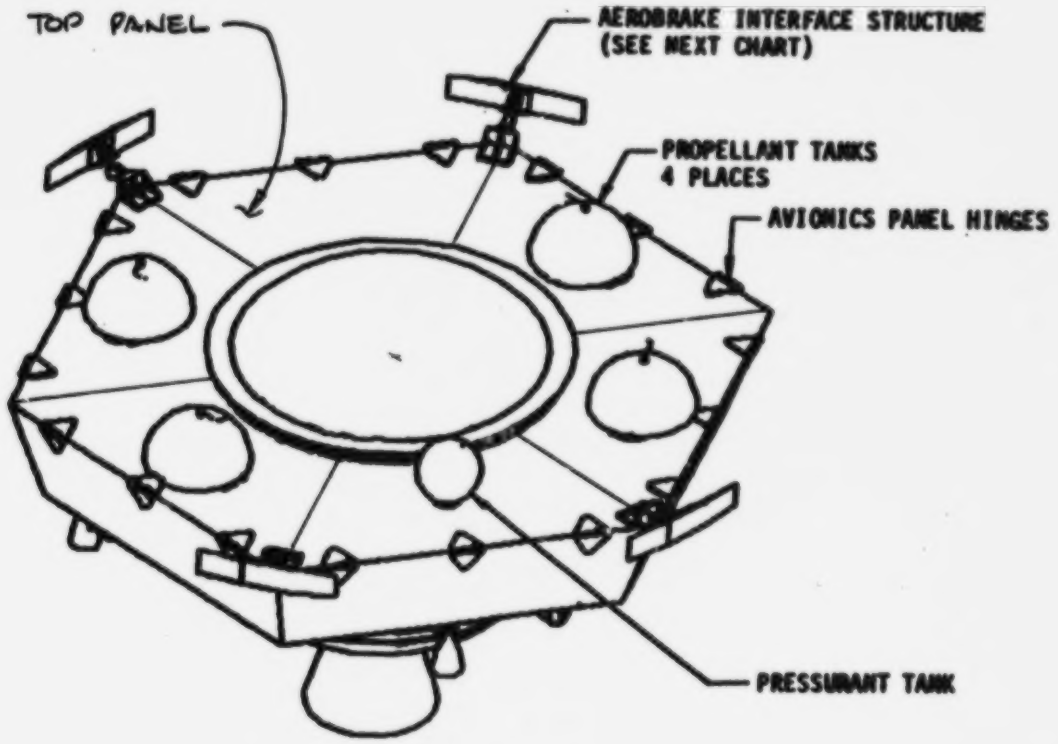
FIG 2.4 AFE CARRIER VEHICLE (AERO BRAKE OMITTED) SHOWING AEROBRAKE ATTACH MENT HARDWARE

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Model: AFE
Report No.
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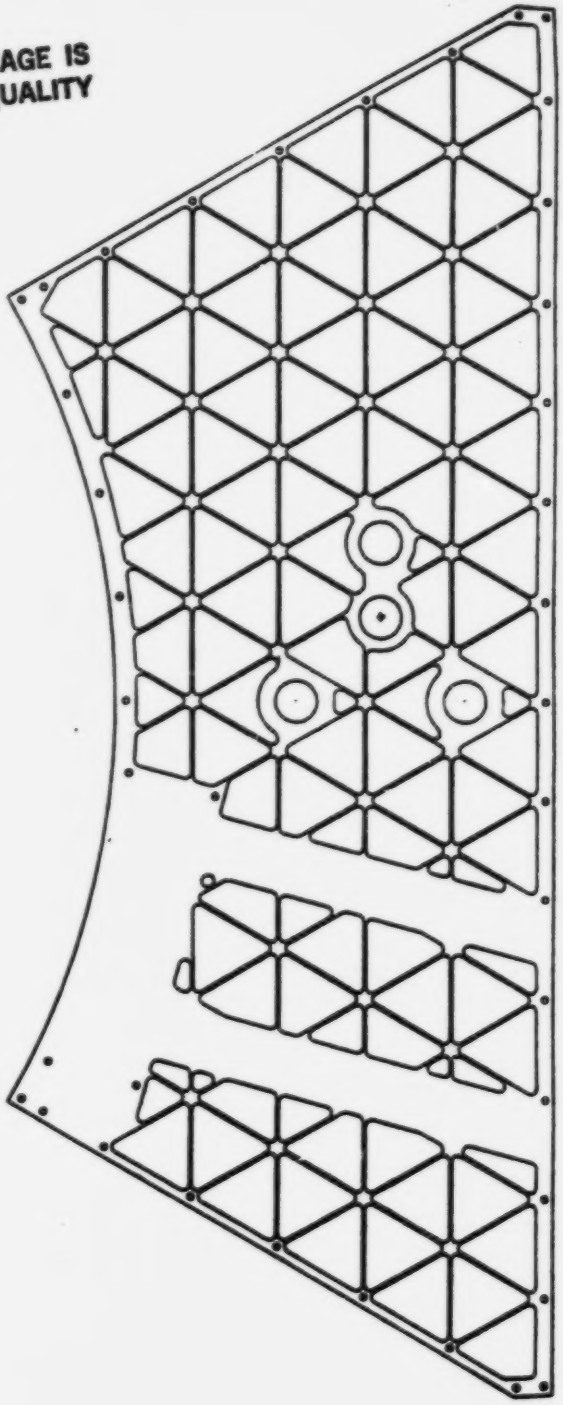

FIG. 2.5 AFE CV LOWER PANEL - BAY 1

## 2.0 STRUCTURAL DESCRIPTION (CONT'D)

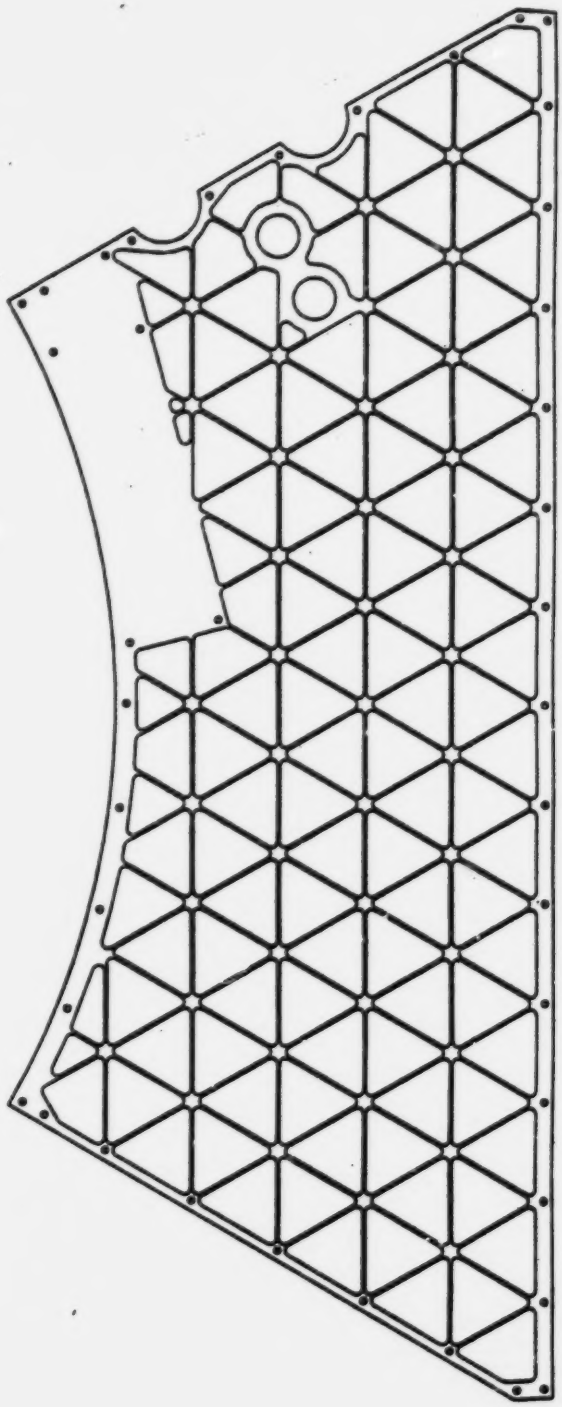

FIG. 2.6 AFE CV LOWER PANEL - BAY 2

## 2.0 STRUCTURAL DESCRIPTION (CONT'D)

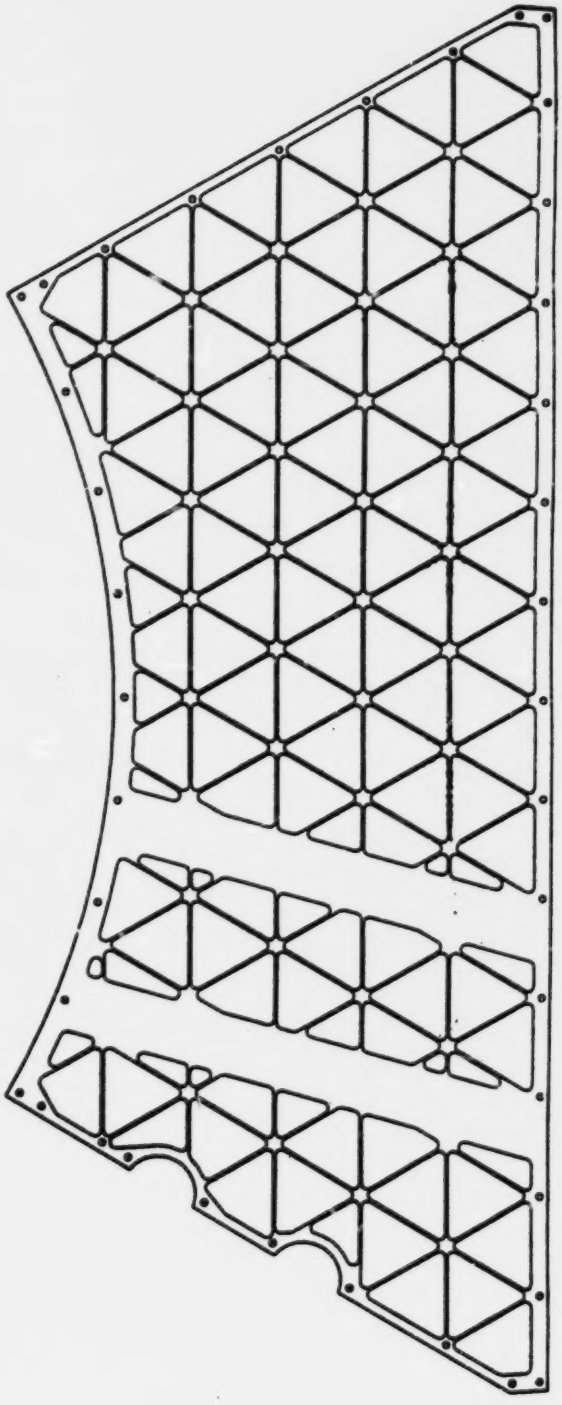

FIG 2.7 AFE CV LOWER PANEL - BAY 3

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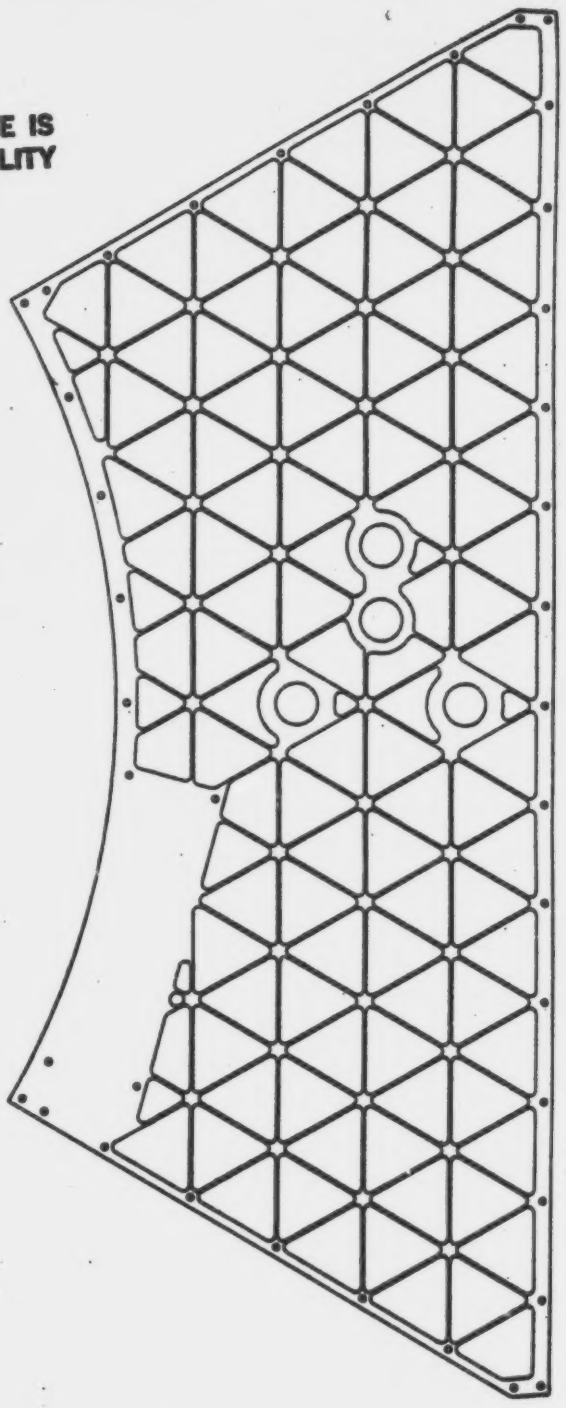

FIG 2.8 ACE CV LOWER PANEL - BAY 4

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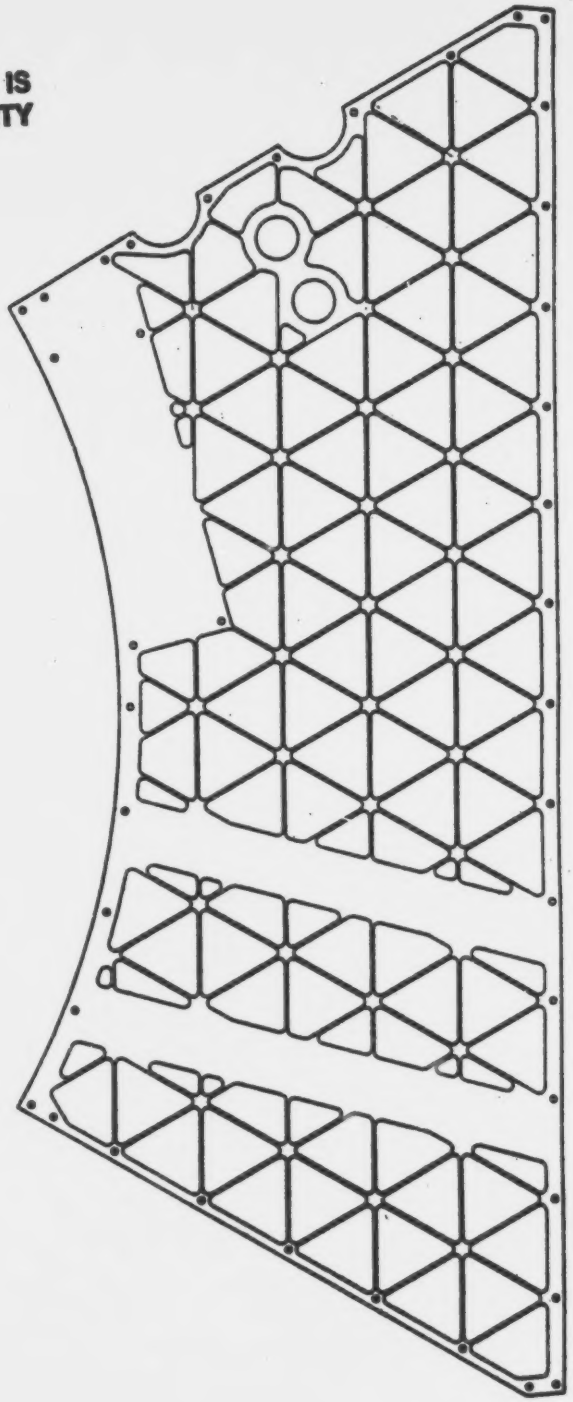

FIG. 2A AFE CV LOWER PANEL - BAY 5

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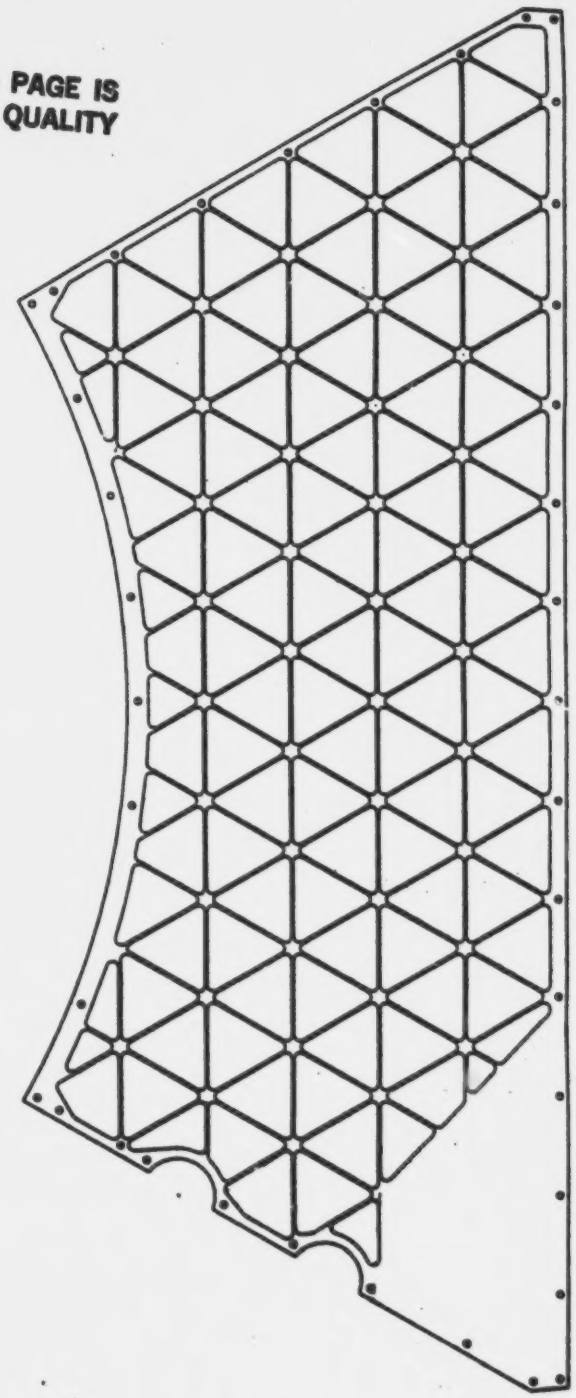

FIG. 2.10 AFE CV LOWER PANEL - BAY 6

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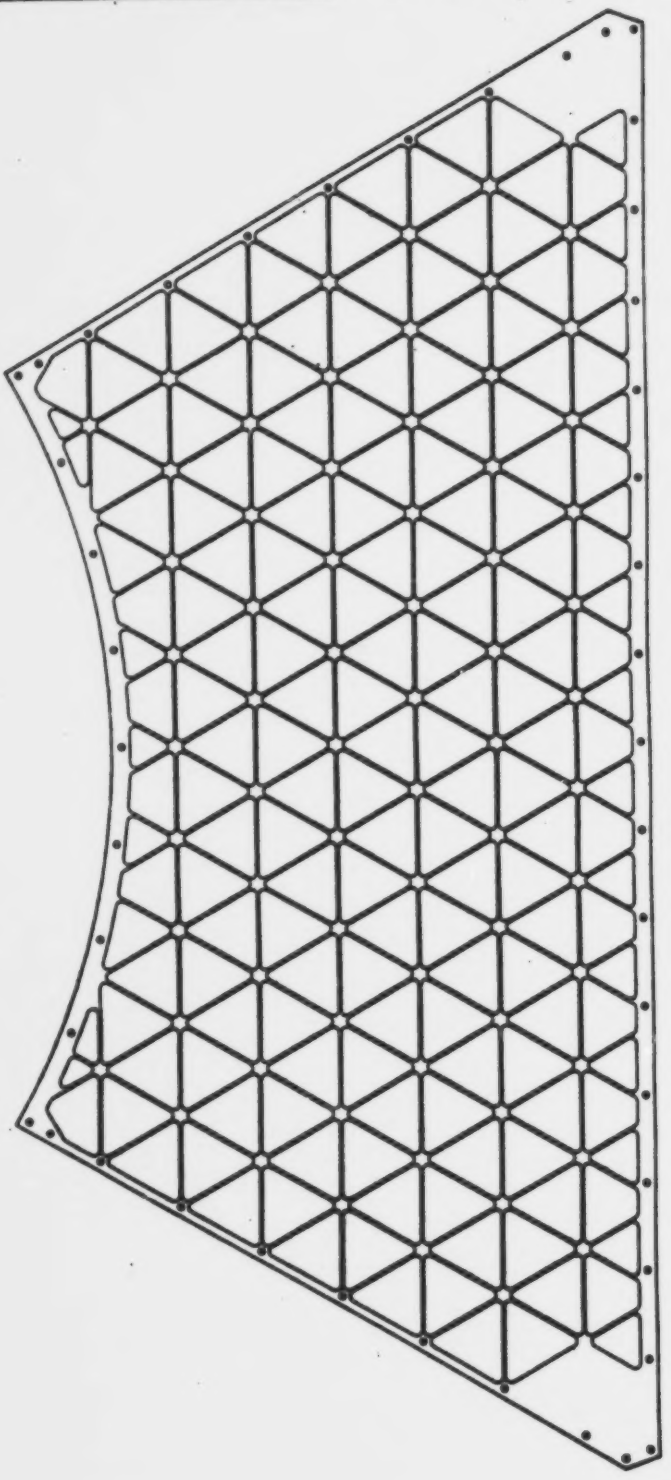

FIG. 2.11 AFE CV UPPER PANEL – BAYS 1 & 4

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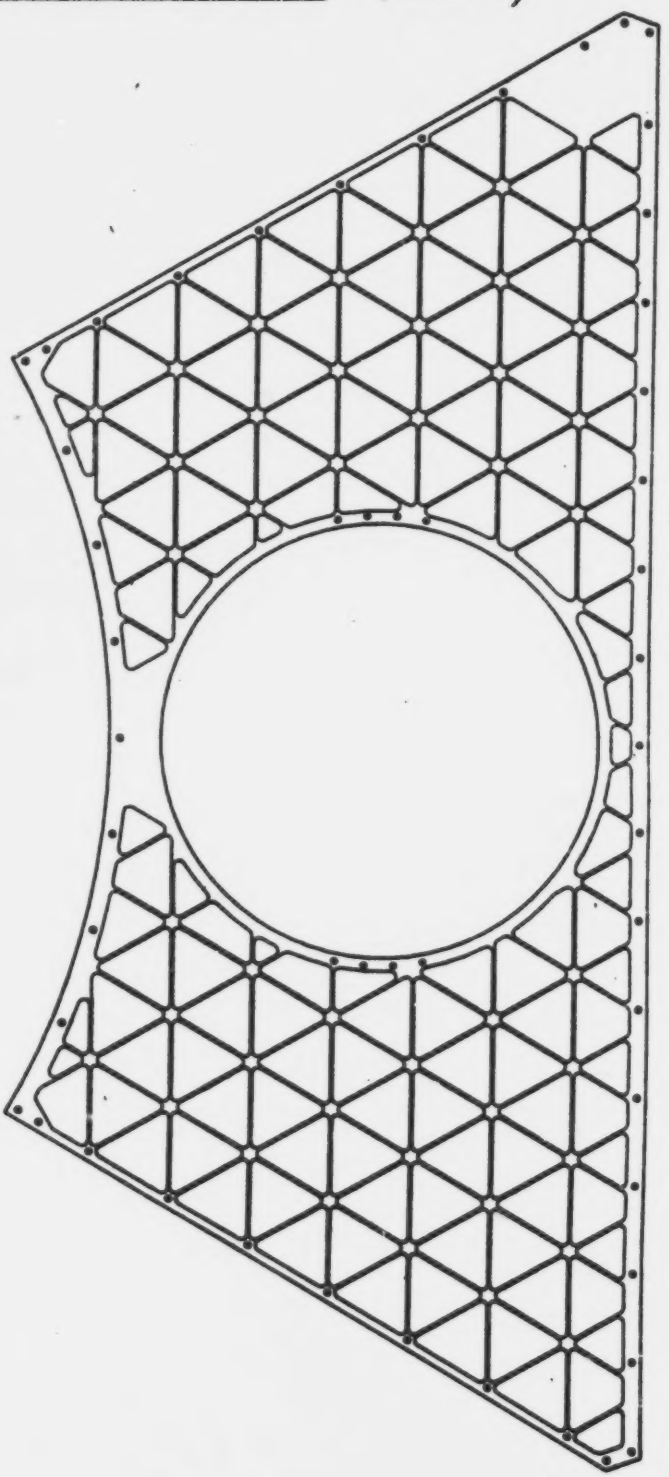

FIG. 2.11 AFE CV UPPER PANEL - BAYS 2,3,5 & 6

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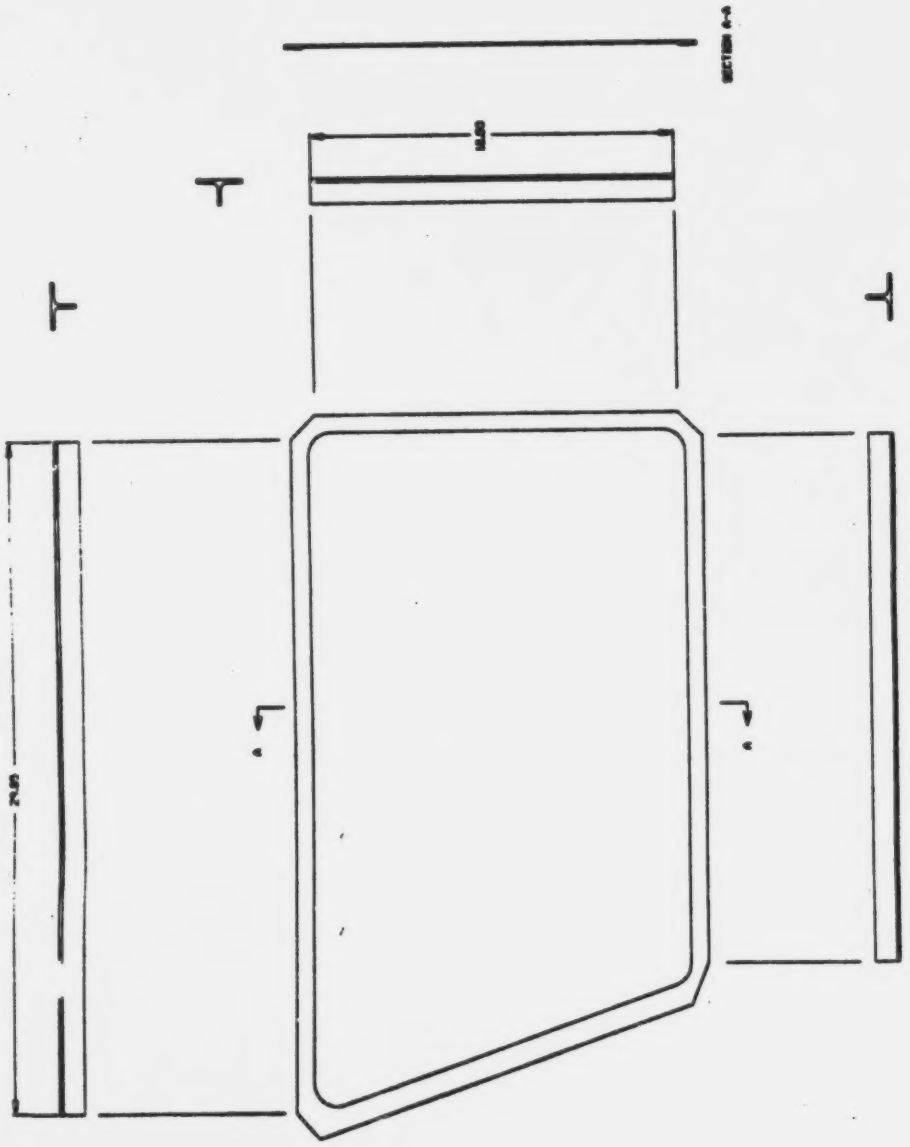

FIG. 2.13 AFE CV RADIAL BEAM AT NON THRUSTER LOCATIONS

## 2.0 STRUCTURAL DESCRIPTION (CONT'D)

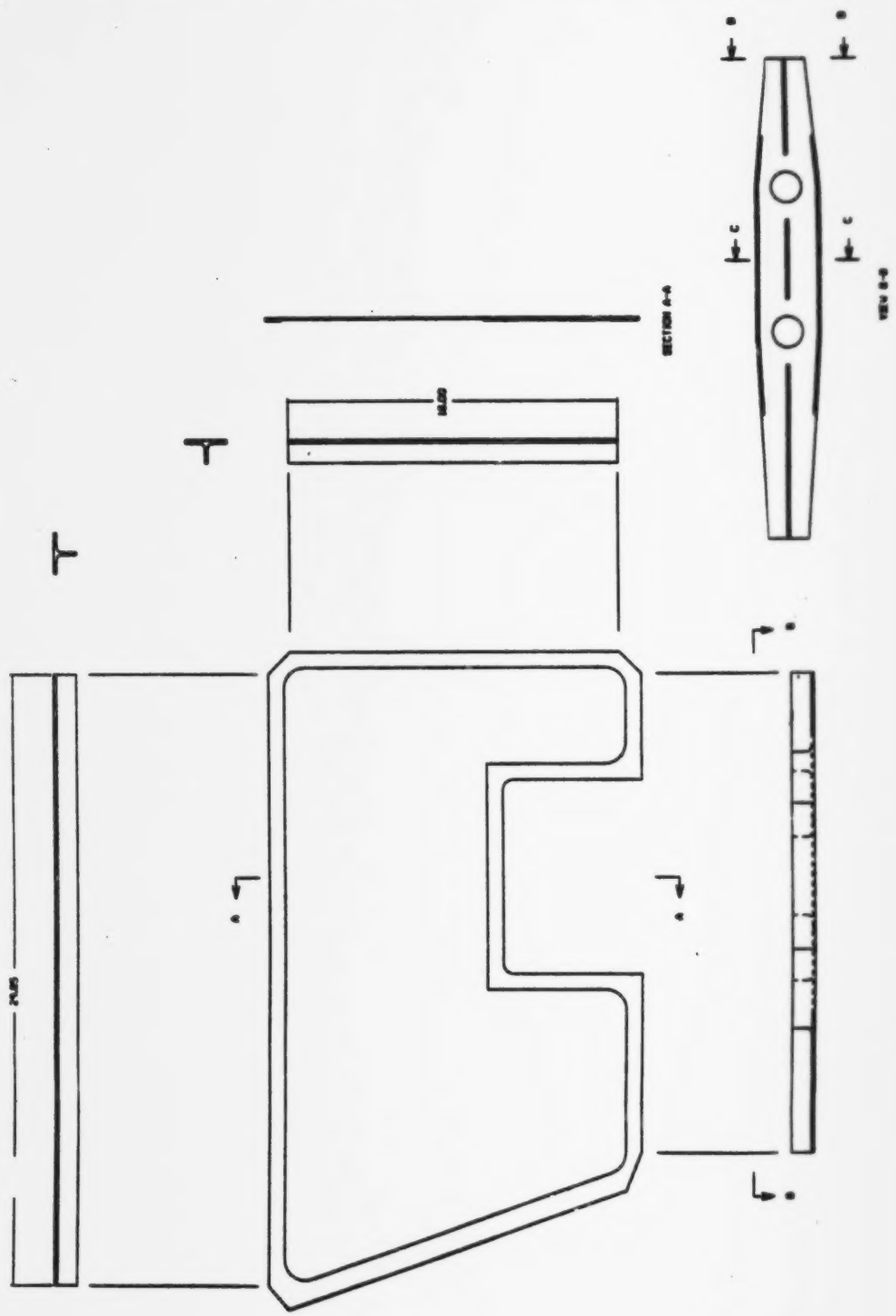

FIG. 2.14 AFE CV RADIAL BEAM @ THRUSTER FITTING

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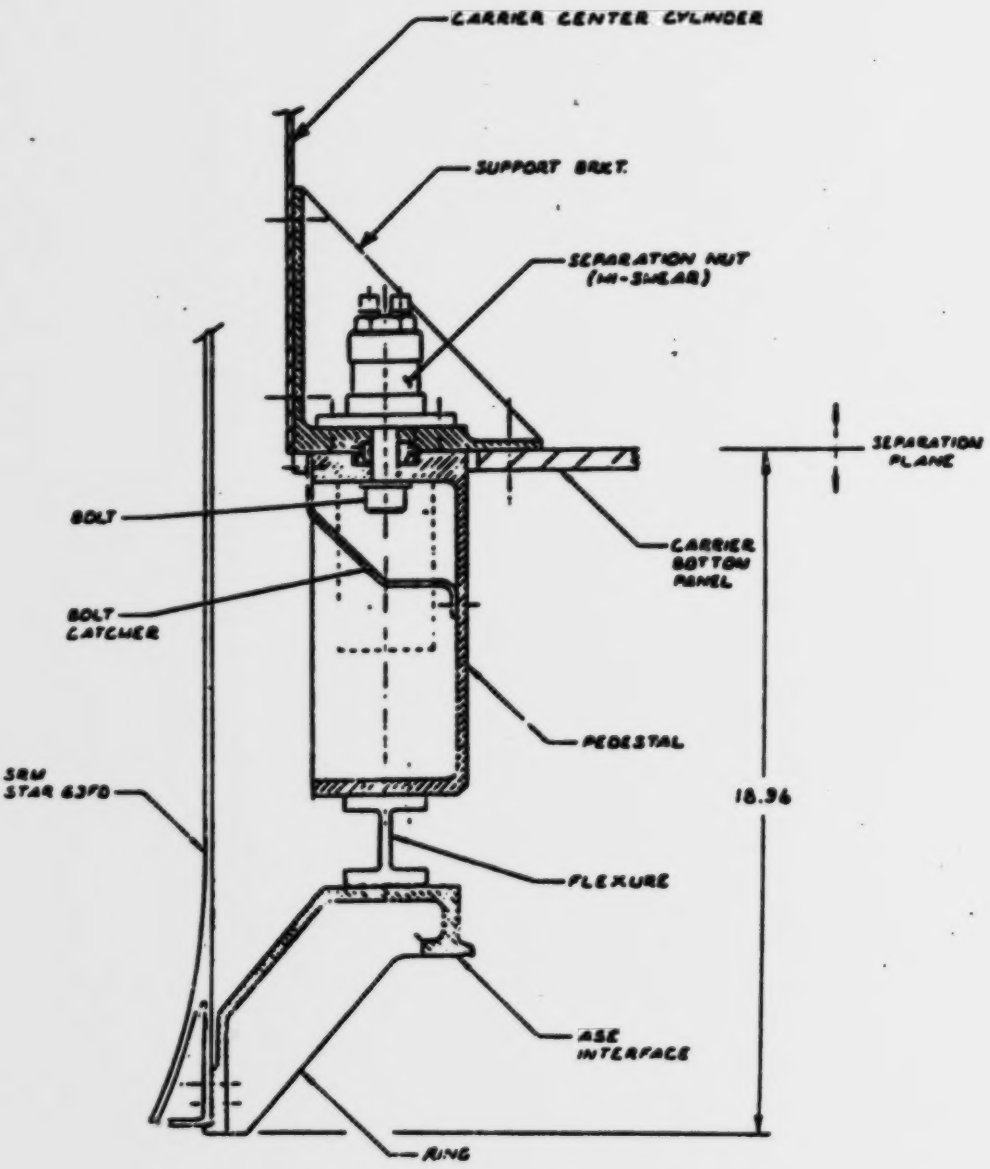


FIG 2.15 SRM SUPPORT BRACKET / JETTISON SYSTEM - SIDE VIEW (TYPICAL 3 PLACES)

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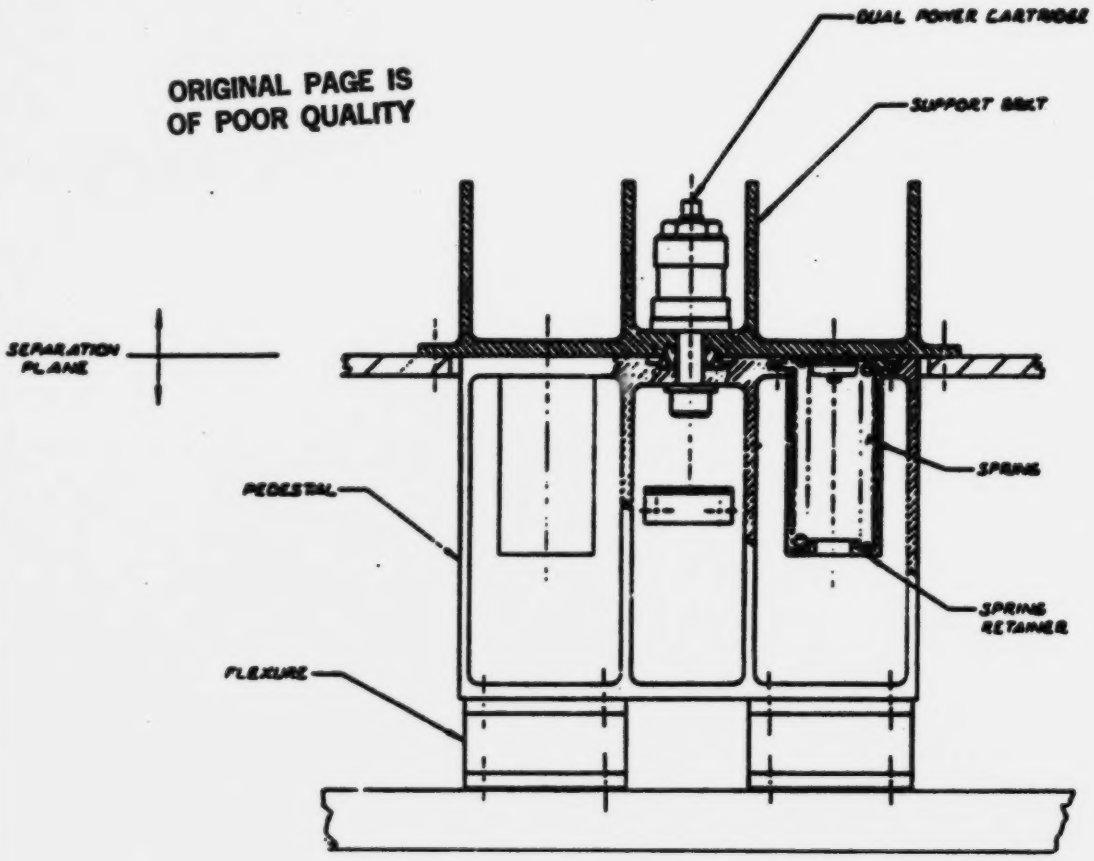


FIG. 2.16 SRM SUPPORT BRACKET / JETTISON SYSTEM - FRONT VIEW (TYPICAL 3 PLACES)

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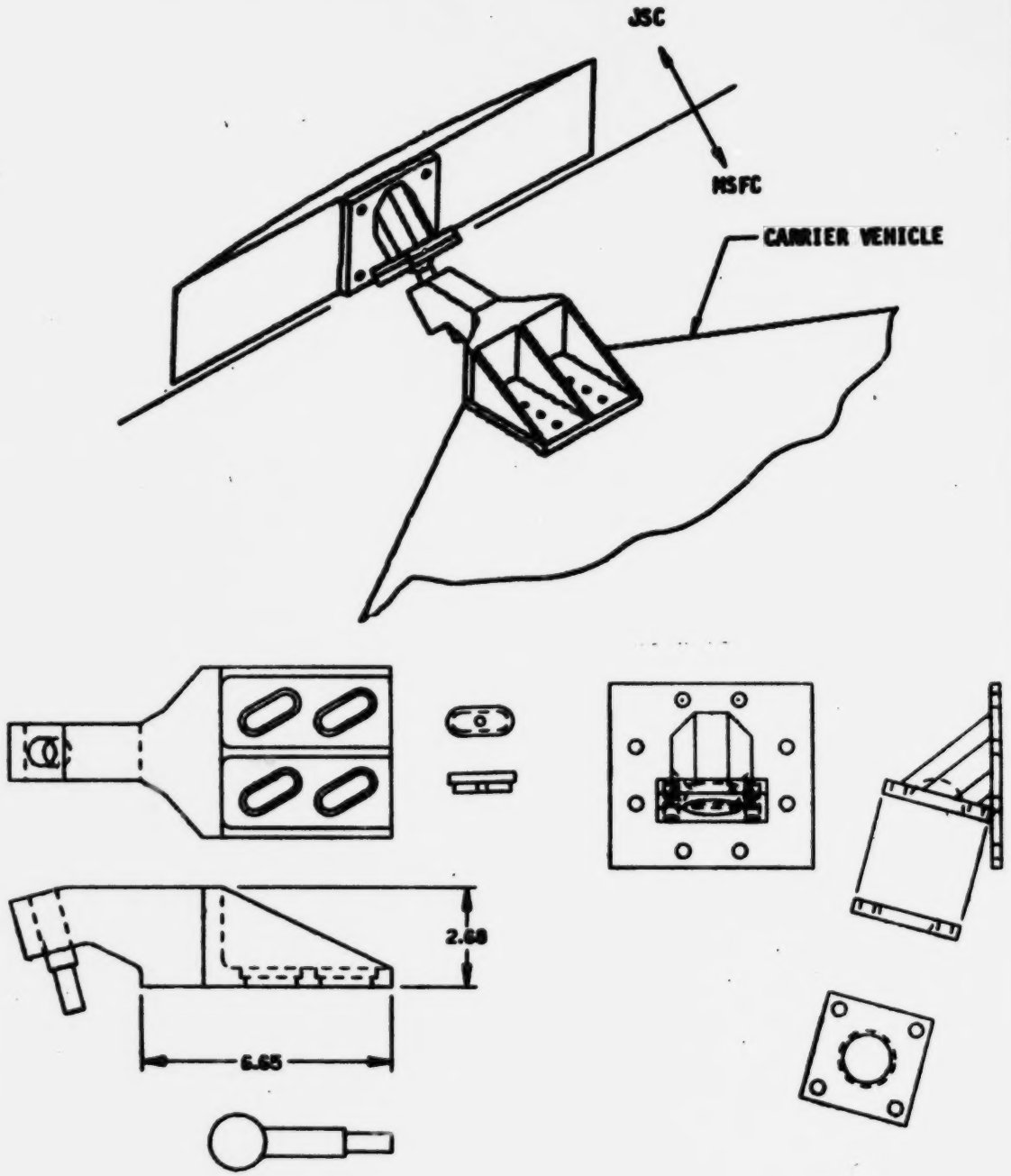


FIG. 2.17 AEROBRAKE ATTACH FITTING DETAILS

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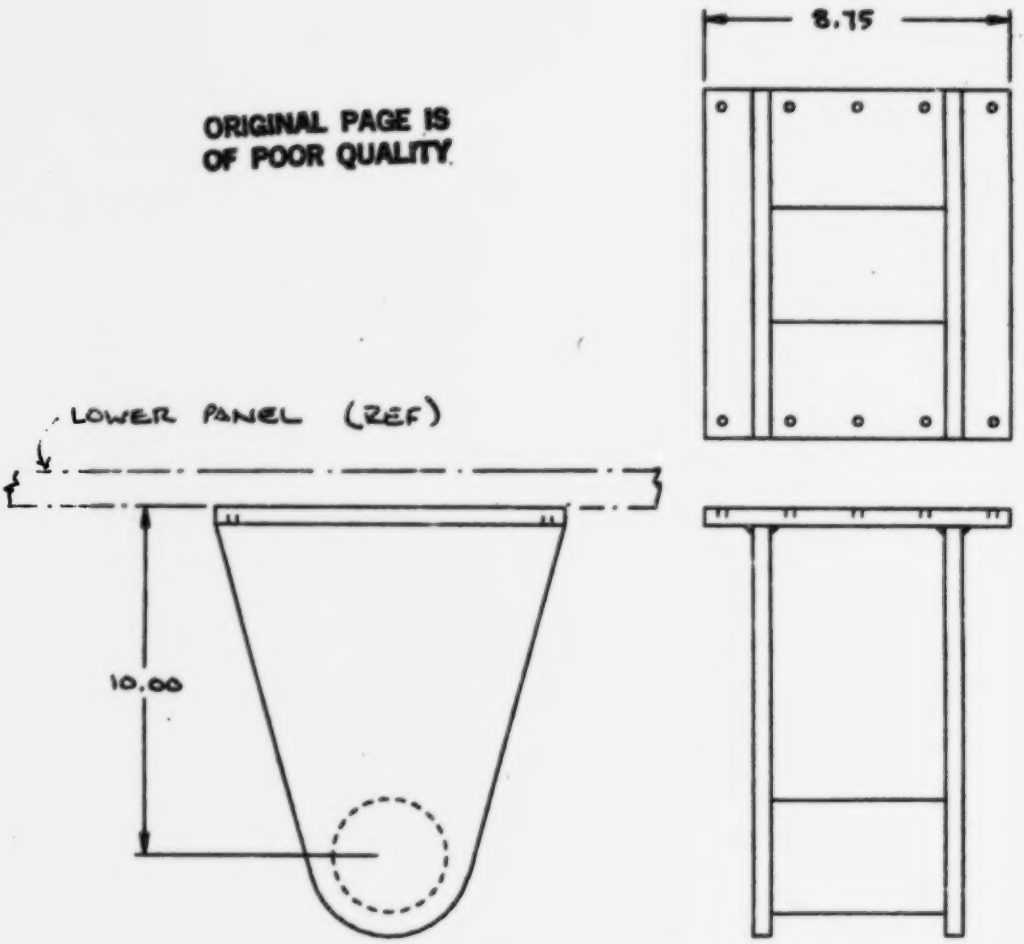


FIG. 2.18 NORMAL LANDING TRUNNION FITTINGS (TYPICAL 3 PLACES)

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# 3.0 MECHANICAL PROPERTIES

TABLE 3.1 *Design Mechanical Properties of 2219 Aluminum Alloy Sheet and Plate*

| Specification | QQ-A-250/30 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Form | Sheet and plate | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Temper | T62[a] | | T81 | | T851 | | | | | | | | | | | | T87 | | | | | | | | | | | |
| Thickness, in. | 0.020-2.000 | | 0.020-0.249 | | 0.250-1.000 | | 1.001-2.000 | | 2.001-3.000 | | 3.001-4.000 | | 4.001-5.000 | | 5.001-6.000 | | 0.020-0.039 | | 0.040-0.249 | | 0.250-1.000 | | 1.001-2.000 | | 2.001-3.000 | | 3.001-4.000 | | 4.001-5.000 | |
| Basis | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| **Mechanical properties:** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $F_{tu}$, ksi: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | 54 | 55 | 62 | 63 | 62 | 63 | 62 | 63 | ... | ... | ... | ... | ... | ... | ... | ... | 63 | 64 | 63 | 64 | 63 | 64 | 63 | 64 | ... | ... | ... | ... | ... | ... |
| LT | 54 | 55 | 62 | 63 | 62 | 63 | 62 | 63 | 62 | 63 | 60 | 61 | 59 | 60 | 57 | 58 | 64 | 65 | 64 | 65 | 64 | 65 | 64 | 65 | 64 | 65 | 62 | 63 | 61 | 62 |
| $F_{ty}$, ksi: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | 36 | 37 | 47 | 48 | 47 | 48 | 47 | 48 | ... | ... | ... | ... | ... | ... | ... | ... | 51 | 52 | 52 | 53 | 51 | 52 | 51 | 52 | ... | ... | ... | ... | ... | ... |
| LT | 36 | 37 | 46 | 47 | 46 | 47 | 46 | 47 | 45 | 46 | 44 | 45 | 43 | 44 | 42 | 43 | 52 | 53 | 52 | 53 | 51 | 52 | 51 | 52 | 51 | 52 | 50 | 51 | 49 | 50 |
| $F_{cy}$, ksi: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | 38 | 39 | 48 | 49 | 48 | 49 | 47 | 48 | ... | ... | ... | ... | ... | ... | ... | ... | 52 | 53 | 52 | 53 | 51 | 52 | 51 | 52 | ... | ... | ... | ... | ... | ... |
| LT | 38 | 39 | 49 | 50 | 49 | 50 | 49 | 50 | ... | ... | ... | ... | ... | ... | ... | ... | 55 | 56 | 55 | 56 | 54 | 55 | 54 | 55 | ... | ... | ... | ... | ... | ... |
| $F_{su}$, ksi | 32 | 32 | 36 | 36 | 36 | 36 | 36 | 37 | ... | ... | ... | ... | ... | ... | ... | ... | 37 | 38 | 37 | 38 | 37 | 37 | 38 | 38 | ... | ... | ... | ... | ... | ... |
| $F_{bru}$[b], ksi: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (e/D=1.5) | 84 | 86 | 95 | 97 | 95 | 97 | 95 | 97 | ... | ... | ... | ... | ... | ... | ... | ... | 99 | 101 | 99 | 101 | 99 | 101 | 99 | 101 | ... | ... | ... | ... | ... | ... |
| (e/D=2.0) | 109 | 111 | 121 | 123 | 121 | 123 | 120 | 122 | | | | | | | | | 126 | 128 | 126 | 128 | 126 | 128 | 126 | 128 | ... | ... | ... | ... | ... | ... |
| $F_{bry}$[b], ksi: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (e/D=1.5) | 63 | 65 | 77 | 78 | 77 | 78 | 77 | 78 | ... | ... | ... | ... | ... | ... | ... | ... | 84 | 86 | 84 | 86 | 83 | 84 | 83 | 84 | ... | ... | ... | ... | ... | ... |
| (e/D=2.0) | 79 | 82 | 93 | 95 | 93 | 95 | 93 | 95 | ... | ... | ... | ... | ... | ... | ... | ... | 97 | 99 | 97 | 99 | 95 | 97 | 95 | 97 | ... | ... | ... | ... | ... | ... |
| e, percent (S Basis): | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| LT | 6 | ... | 6 | ... | 8 | ... | 7 | ... | 6 | ... | 5 | ... | 5 | ... | 4 | ... | 5 | ... | 6 | ... | 7 | ... | 6 | ... | 6 | ... | 4 | ... | 3 | ... |
| $E$, $10^6$ ksi | 10.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $E_c$, $10^6$ ksi | 10.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $G$, $10^6$ ksi | 4.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\mu$ | 0.33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Physical properties:** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\omega$, lb/in.$^3$ | 0.102 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $C$, Btu/(lb)(F) | See Figure 3.3.6.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $K$, Btu/(hr)(ft$^2$)(F)/ft | See Figure 3.3.6.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\alpha$, $10^{-6}$ in./in./F | See Figure 3.3.6.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

[a] See Table 3.1.2.1.1. Bearing values are "dry pin" values per Section 1.4.7.1.

[b] T62 and T81: 0.020-0.039 in., 6 percent; 0.040-0.249 in., 7 percent; T62: 0.250-1.000 in., 8 percent; 1.00-2.000 in., 7 percent.

[c] These allowables apply when samples of material supplied in the O or F temper are heat treated to demonstrate response to heat treatment. Properties obtained by the user however, may be lower than those listed if the material has been formed or otherwise cold or hot worked, particularly in the annealed temper, prior to solution heat treatment.

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Approved by: Date:

LOCKHEED MISSILES & SPACE COMPANY, INC.

Title: AFE CARRIER VEHICLE STRESS ANALYSIS

Model: AFE
Report No.:

Page: 3.1

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3.0 MECHANICAL PROPERTIES (CONT'D)

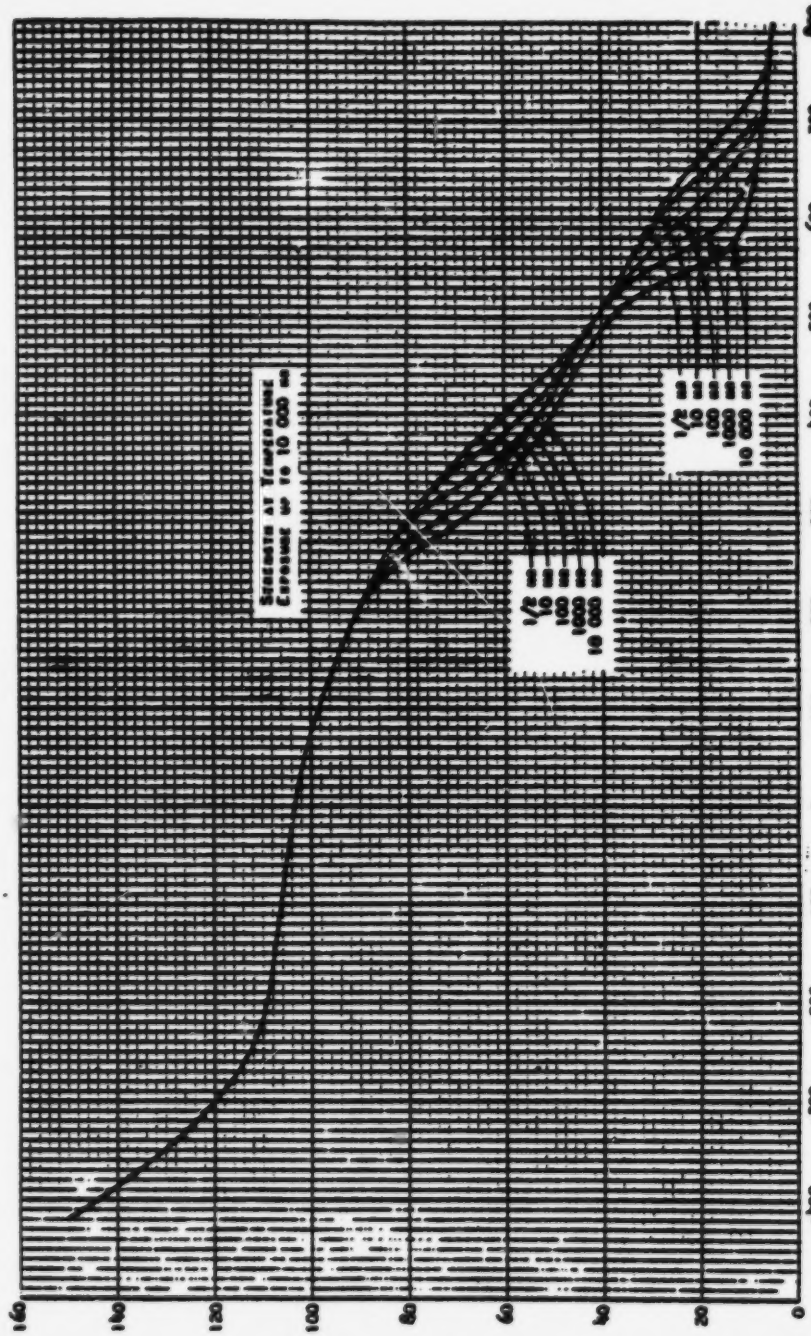


FIGURE 3.1 *Effect of temperature on the ultimate tensile strength ($F_{tu}$) of 2219-T87 aluminum alloy bare and clad sheet and plate.*

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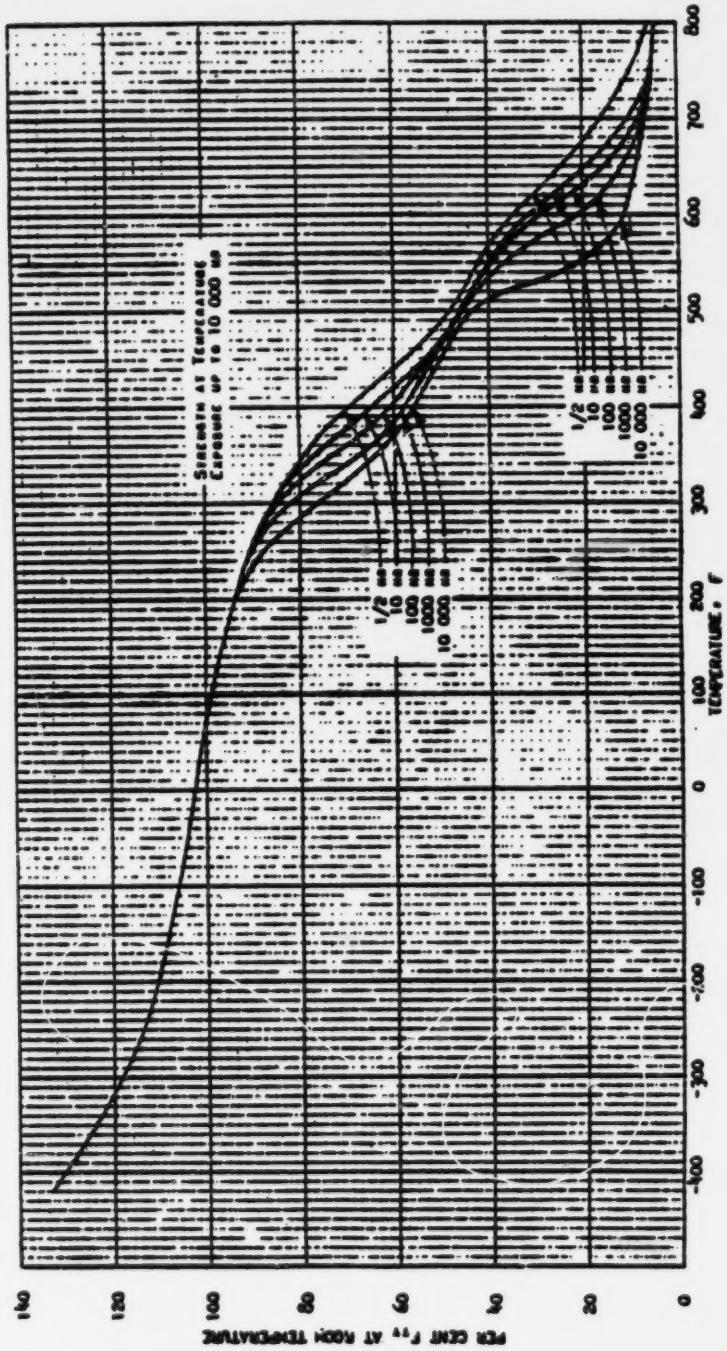


FIGURE 3.2 *Effect of temperature on the tensile yield strength ($F_{ty}$) of 2219-T87 aluminum alloy bare and clad sheet and plate.*

3.0 MECHANICAL PROPERTIES

## 3.0 MECHANICAL PROPERTIES

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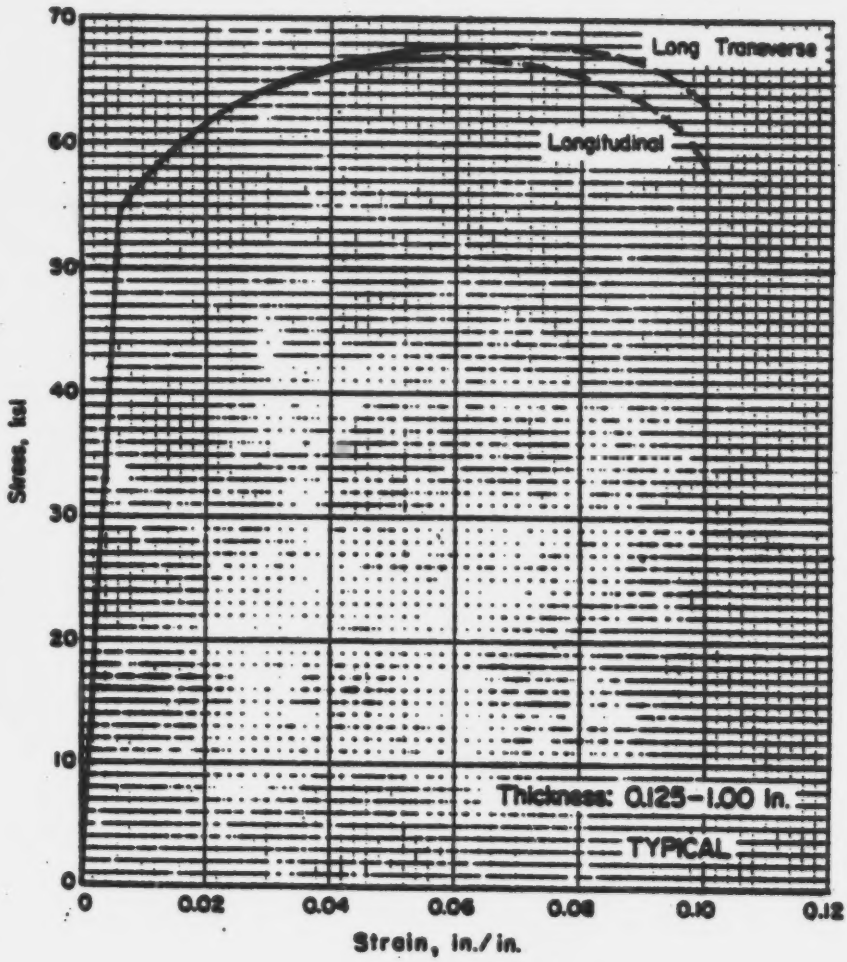



**FIGURE 3.3** *Typical tensile stress-strain curves (full range) for 2219-T87 aluminum alloy sheet and plate at room temperature.*

FORM LMSC 302 83

## 4.1 MODEL DESCRIPTION

The NASTRAN model of the Carrier Vehicle is a full 360 degree model of all six bays of the vehicle. This was done in spite of the cyclic symmetry of the structure in order to simplify the location of the (mounted component) masses and to allow for the eventual inclusion of those structural components that are not symmetric. This model presently includes nearly 2500 nodes and 7500 elements.

During the beginning of the model development, not only the upper and lower panels, but all panels except the cylinder were considered as isogrid construction. For this reason the majority of the panels are modeled using a triangular pattern for the grid points. At the present time the avionics panels and the radial beams are solid sections and are consequently represented by triangular plate (CTRIA) elements. The upper panel is still an open isogrid construction and is made up of bar elements to simulate each individual isogrid bar. The lower panel is isogrid construction like the upper panel but with the addition of a .016" thick aluminum panel. This construction is represented by both individual isogrid CBAR elements and CTRIA elements for the thin sheet. The center cylinder is a solid .125" aluminum sheet and is modeled with CQUAD plate elements. The panel splice tee and angle sections and the upper and lower ring angle sections are simulated in the model with CBAR elements.

The SRM is represented in the model by a concentrated mass and inertia (CONM2) located at the point in AFE coordinates specified by the mass properties group. It is connected through rigid (CRIGD) elements to set of plate elements which simulate the mounting ring. The Carrier Vehicle is attached to this ring through a system of brackets, separation bolts and flexures modeled by plate and bar elements. These SRM Support Brackets are located at three equally spaced points around the Support Ring. Sketches of these Brackets are included in the Structural Description section of this report and the NASTRAN details representing the same structure are given in the model plots which follow.

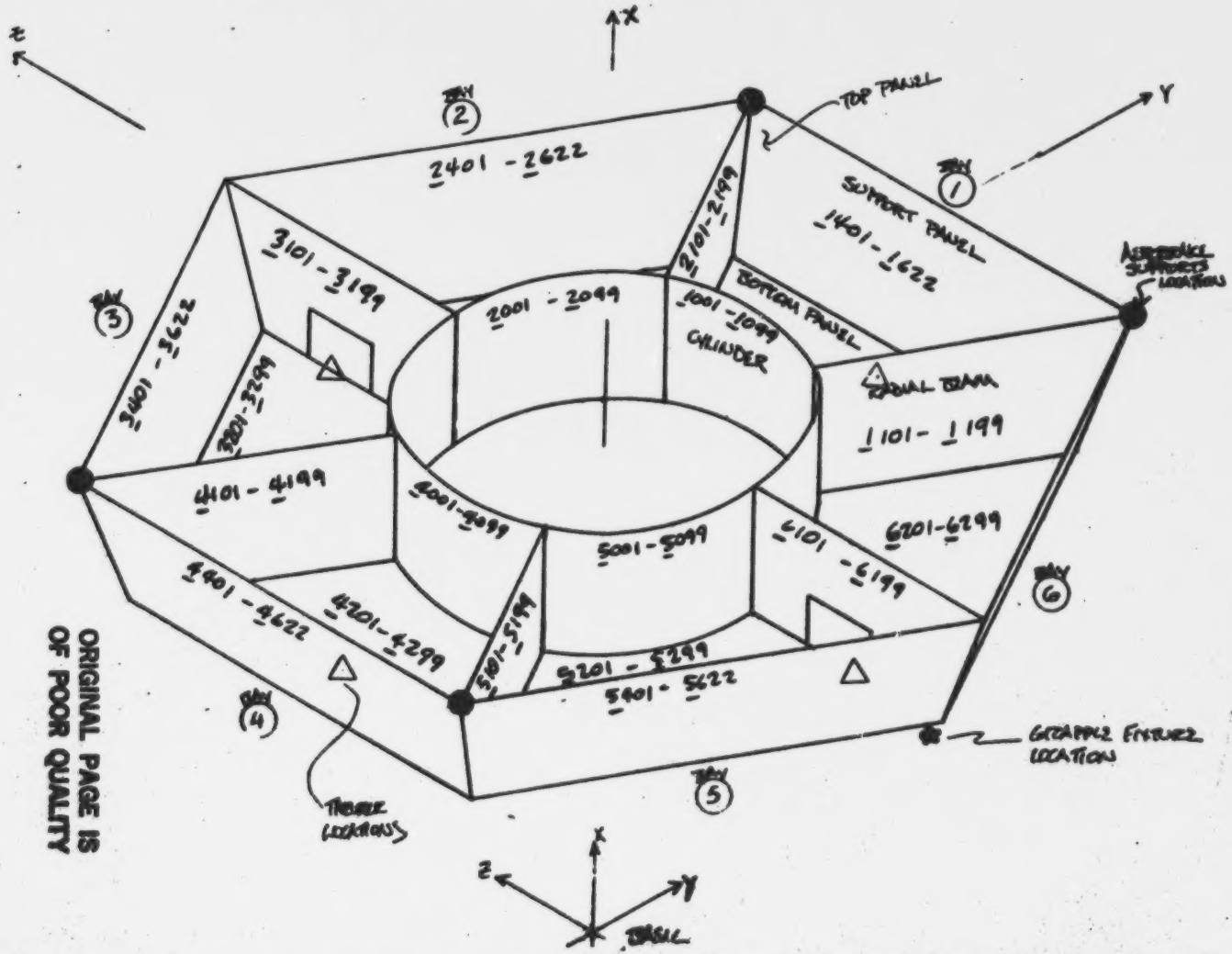
The Aerobrake is presently modeled in a similar method to the SRM. The values from the mass properties table are assigned to a gridpoint at the correct location, and this point is then attached to the Carrier Vehicle at four points. The Aerobrake attach fittings are modeled in enough detail that the fitting flange stresses, attach bolt loads, and connecting pin loads may be obtained from the output.

There are basically two structural configurations modeled at the present time. The liftoff/landing abort model includes the mass and connecting structure associated with the attached SRM. The loads from the Carrier Vehicle & Aerobrake are reacted back into the SRM structure for these conditions as the system is still supported in the payload bay at the support ring. The second model arrangement represents the regular landing configuration in which the AFE has jettisoned the SRM, has been recovered by the Shuttle, and is supported (in the payload bay again) on the three Trunnion fittings. For this configuration the SRM mass and connecting elements have been deleted and the CG node (loading point) has been consequently relocated.

FORM LMSC 302 5-5

## 4.1 MODEL DESCRIPTION (CONT'D)

- GENERAL LAYOUT AND NUMBERING SCHEME

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| Checked by: | Date | Title ATC CARRIER VEHICLE STRESS ANALYSIS | Model |
| Approved by: | Date | | Report No. |

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|---|---|---|---|
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4.1 MODEL DESCRIPTION (CONT'D)

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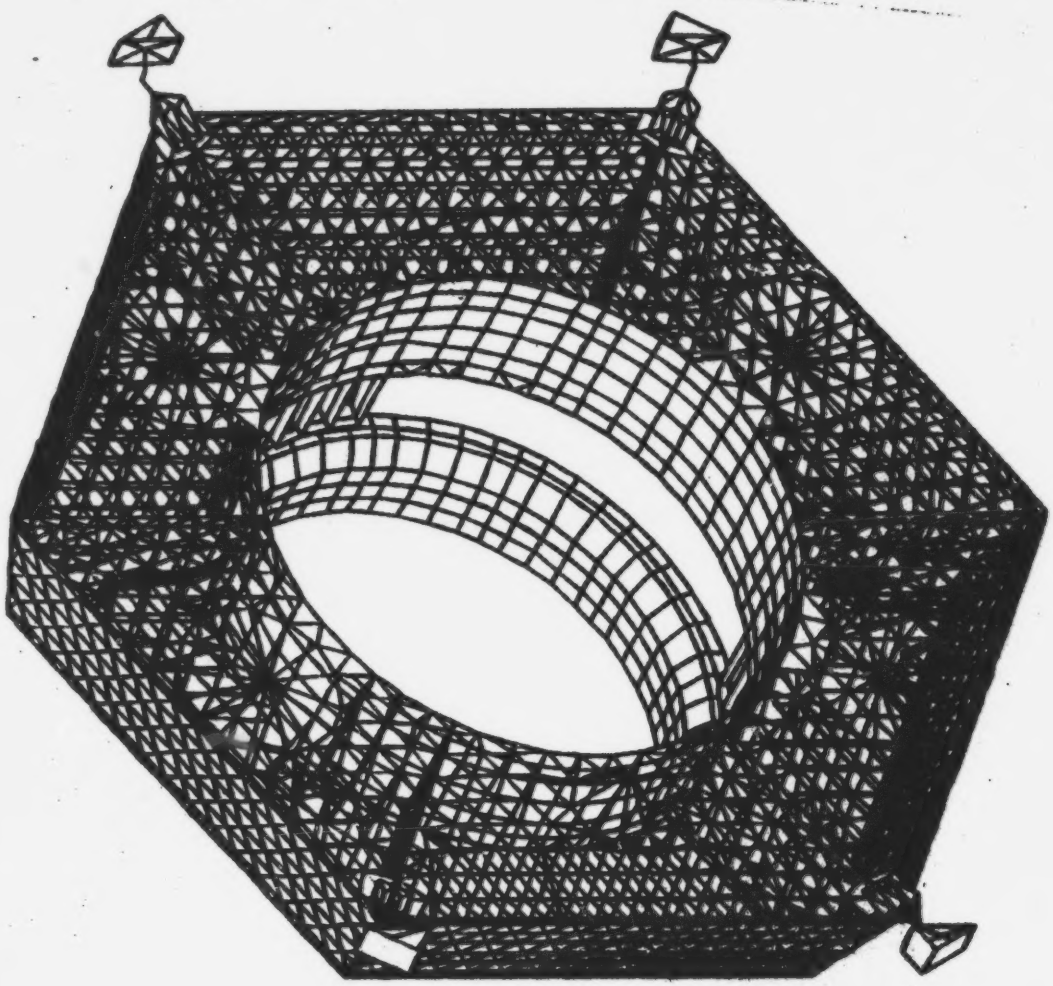
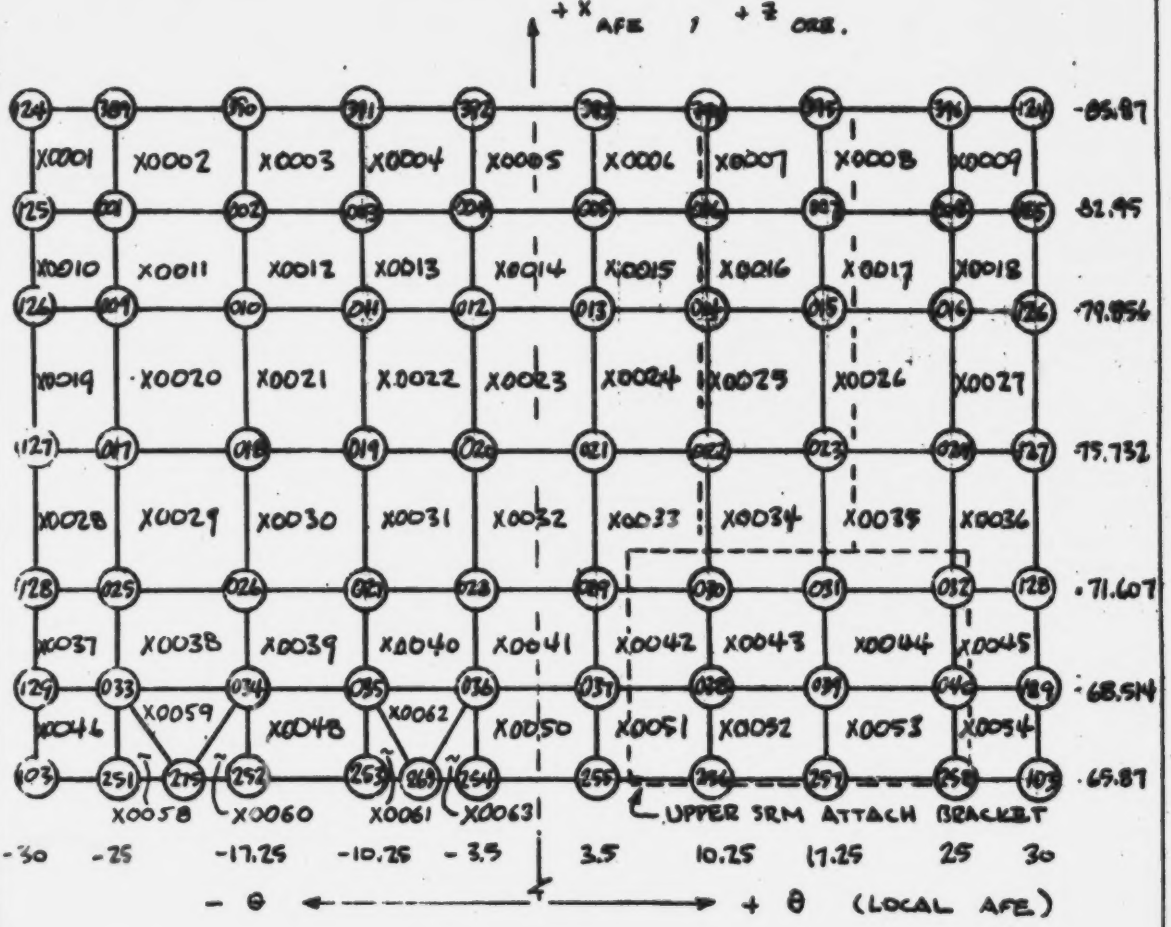


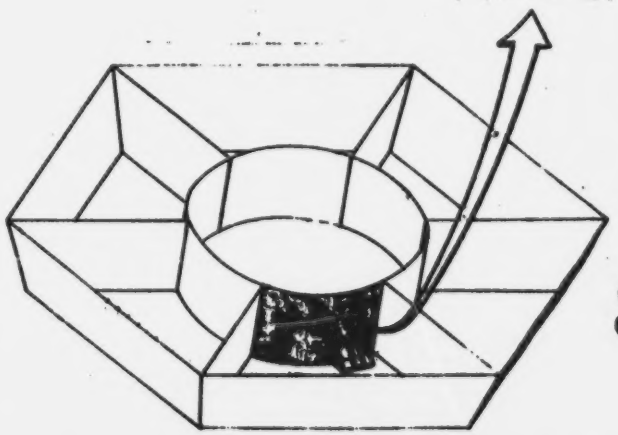
PLOT OF TOTAL CARRIER VEHICLE MODEL SHOWING SRM SUPPORT RING / BRACKETS AND AEROBRAKE ATTACH FITTINGS

FORM LMSC 388 8-3

## 4.1 MODEL DESCRIPTION (CONT'D)

## AFE CARRIER VEHICLE 60° CYLINDER SEGMENT (PANEL 0)



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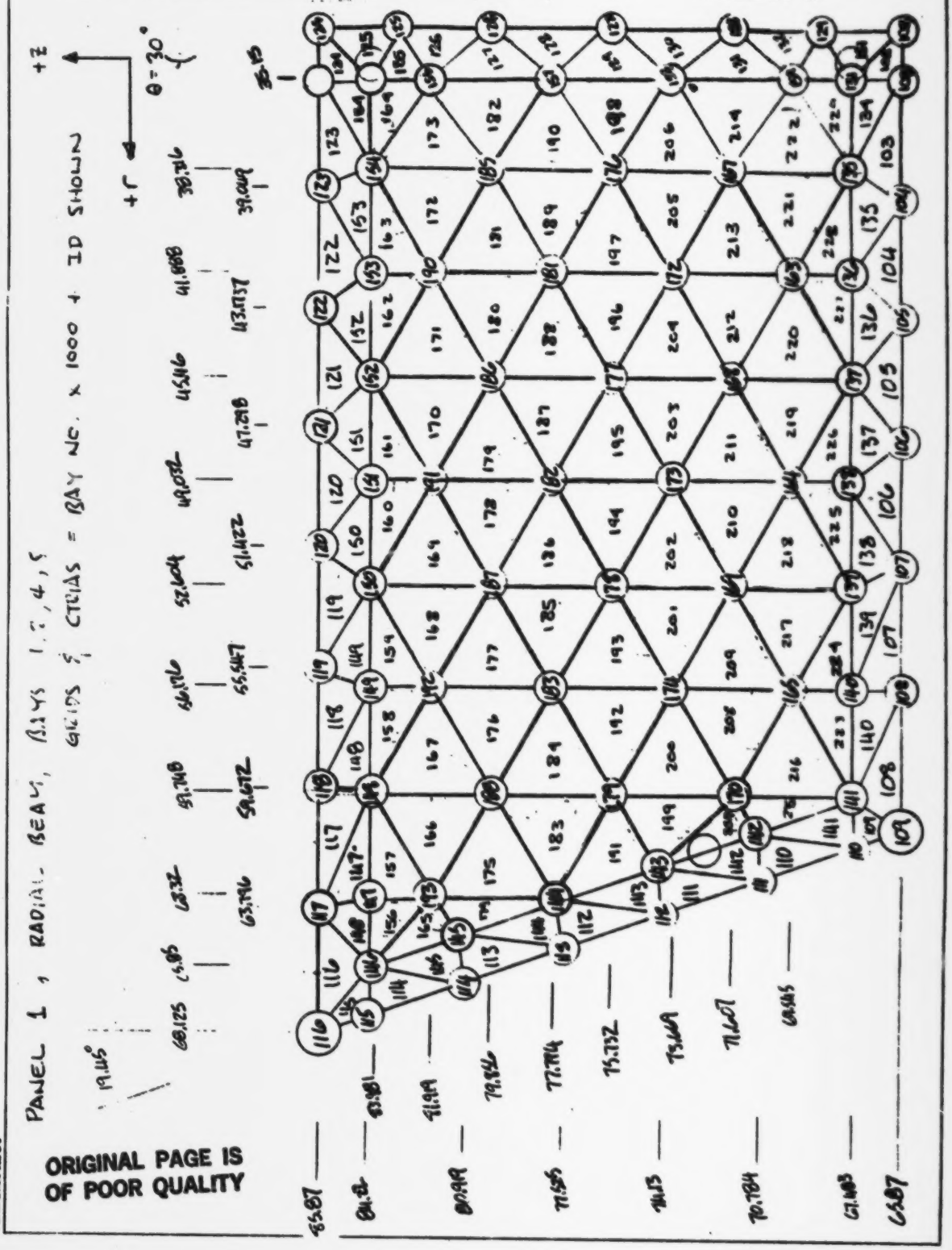
| Approved by: | Date | | Report No. |

A.1 MODEL DESCRIPTION (CONT'D)

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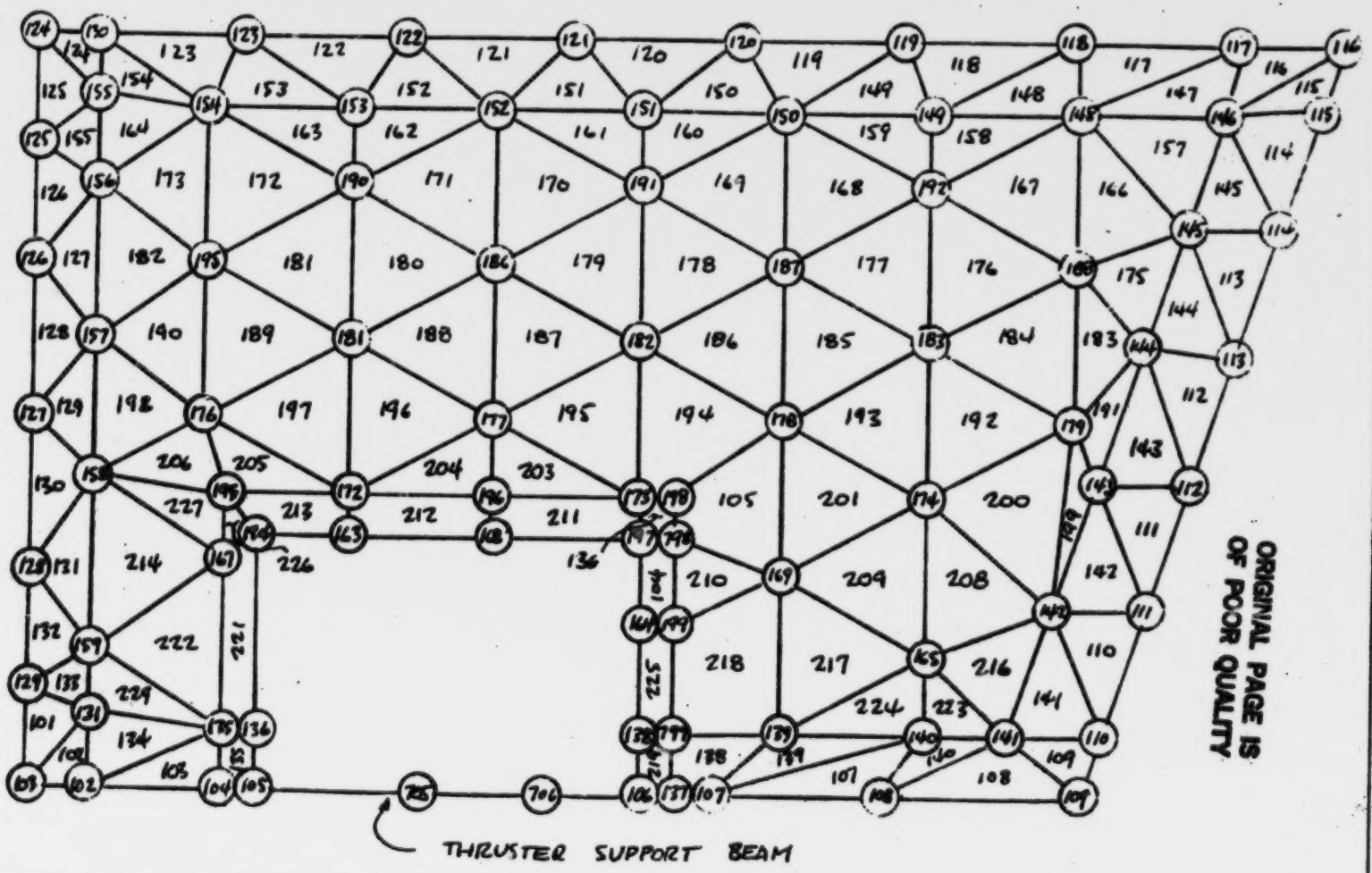
FORM LMSC 202 6-3

4.1 MODEL DESCRIPTION (CONT'D)

PANEL 1, WITH CUTOUT FOR THRUSTER ASSEMBLY - BAYS 3, 6

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Title: ACE CARRIER VEHICLE STRESS ANALYSIS

Model

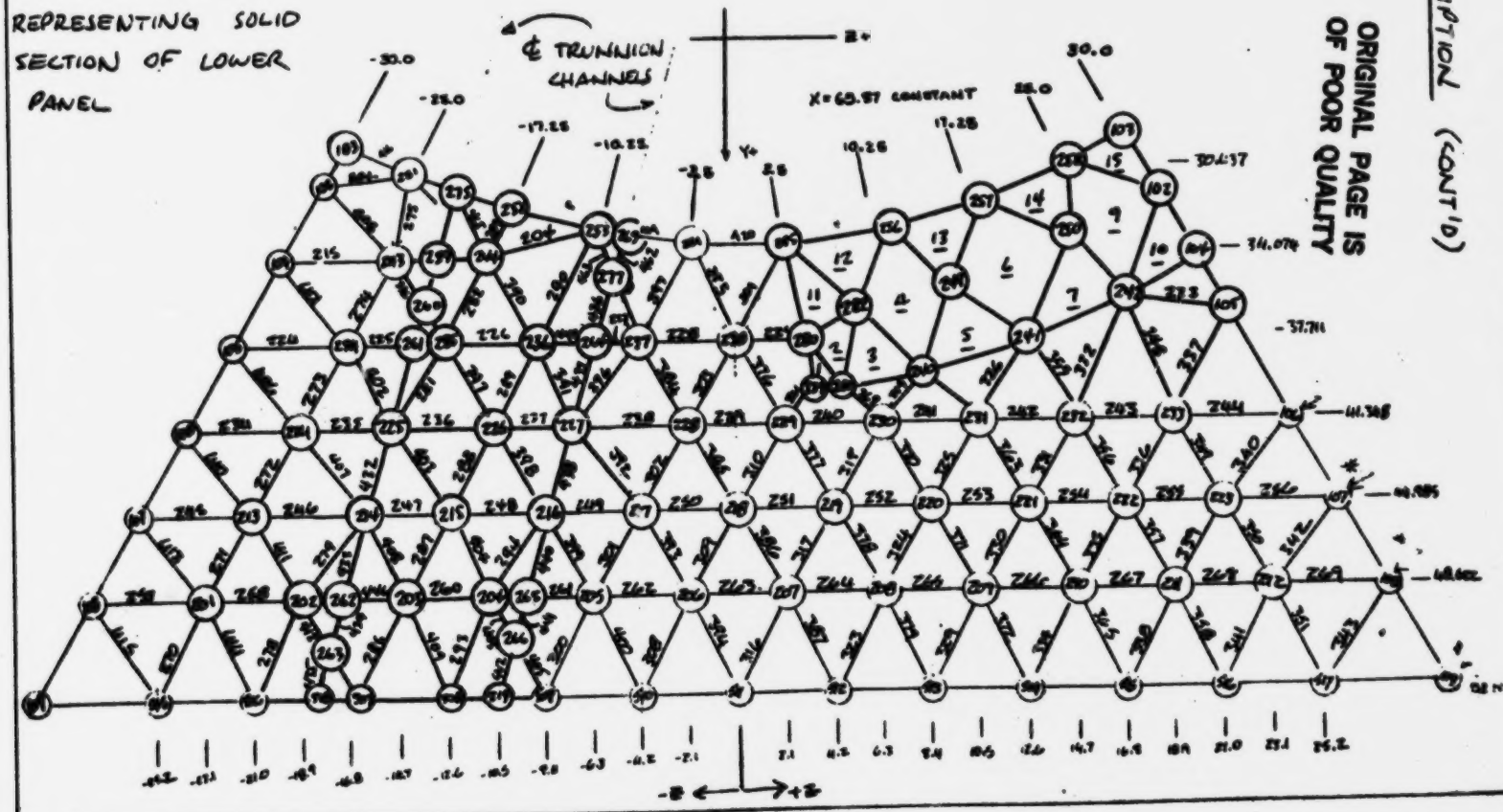
Report No.

Page 4.1.7

PANEL 2 - LOWER PANEL - BAYS 1 3,5
- TRUNNION SUPPORT AND SRM ATTACH BRACKET LOCATIONS

GRID # = (BAY NO) x 1000 + LAYOUT NO.
BAR # = (BAY NO) x 10,000 + (PANEL NO) x 1000 + LAYOUT NO.

ELEMENTS 1 THRU 15 ARE PLATE ELEMENTS REPRESENTING SOLID SECTION OF LOWER PANEL

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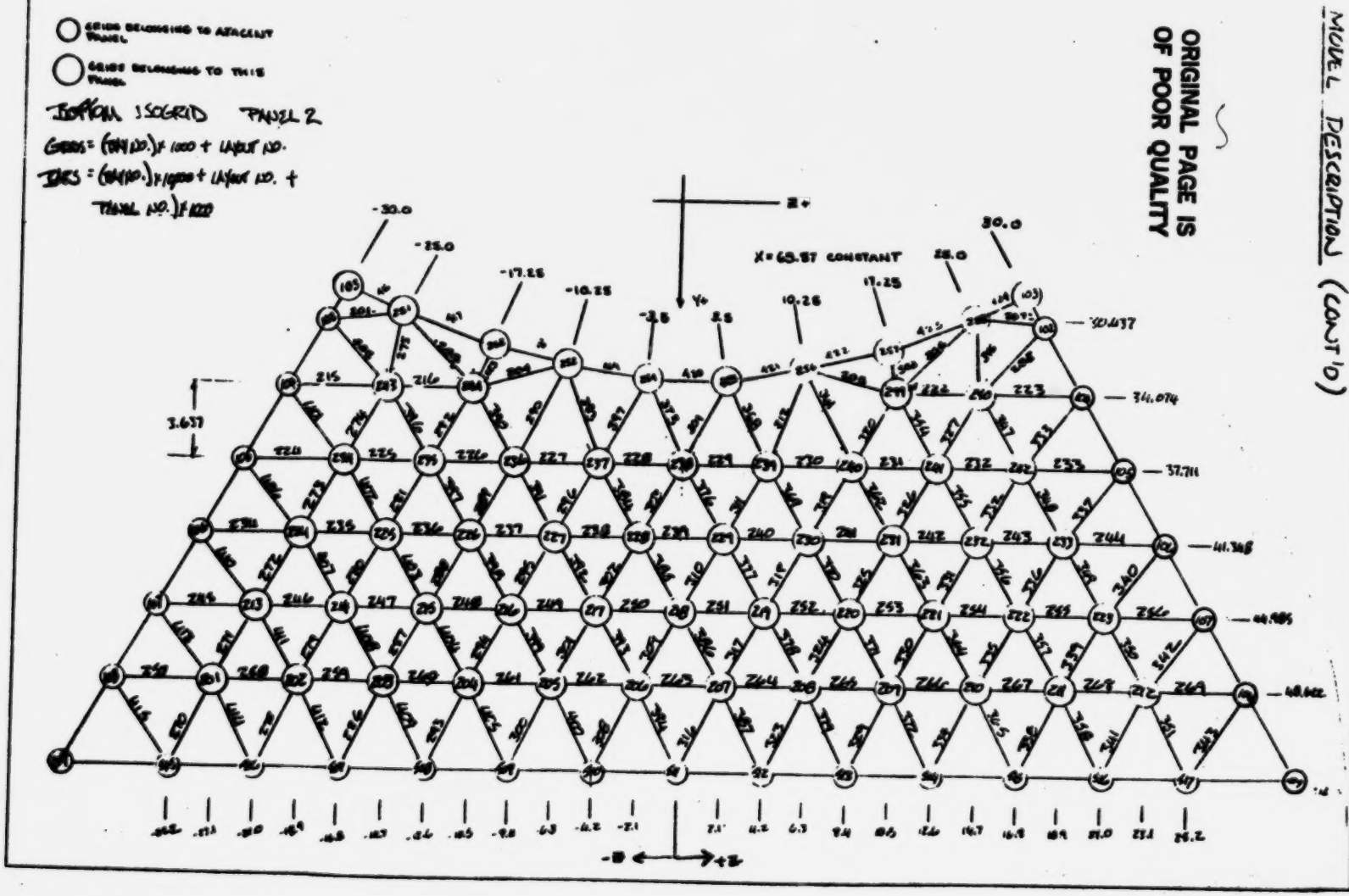
4.1 MODEL DESCRIPTION (CONT'D)

FORM LMSC 362 B-3

PANEL 2 - BAYS 2,4,6 - NO TRUNNION OR SRM SUPPORT STRUCTURE

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4.1 MODEL DESCRIPTION (CONT'D)

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| Checked by | | Date | |
| Approved by | | Date | |

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Title: AFE CARRIER VEHICLE STRESS ANALYSIS

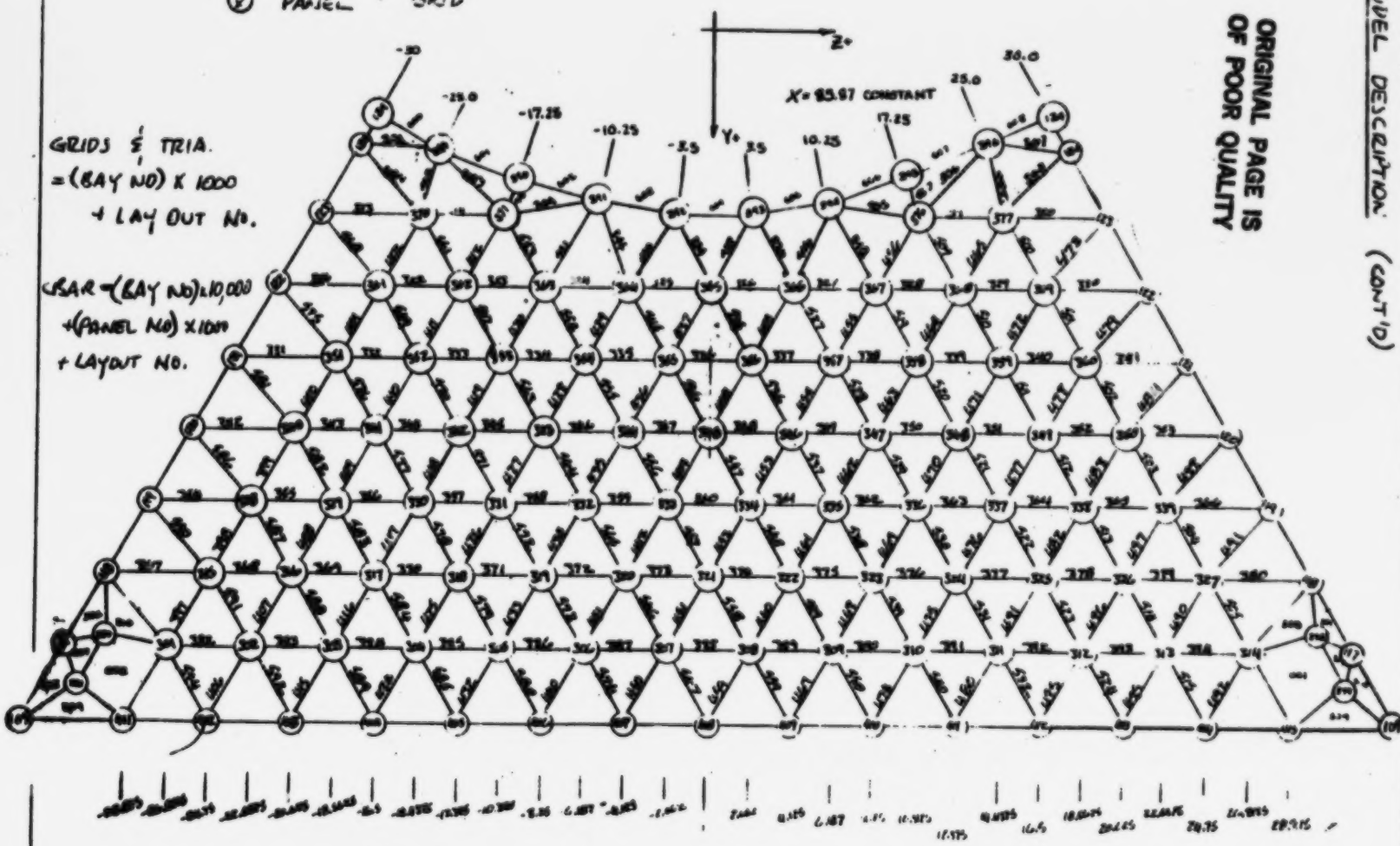
Page 4.1.9

Model

Report No.

FORM LMSC 362 B-3

PANEL 3 - UPPER PANEL, BAY 1

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4.1 MODEL DESCRIPTION (CONT'D)

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| Approved by: | Date: | | Report No. |

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4: MODEL DESCRIPTION (CONT'D)

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PANEL 3 - UPPER PANEL, BAYS 2, 3, 5 & 6 - PROPELLANT TANK LOCATIONS

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4.1 MODEL DESCRIPTION (CONT'D)

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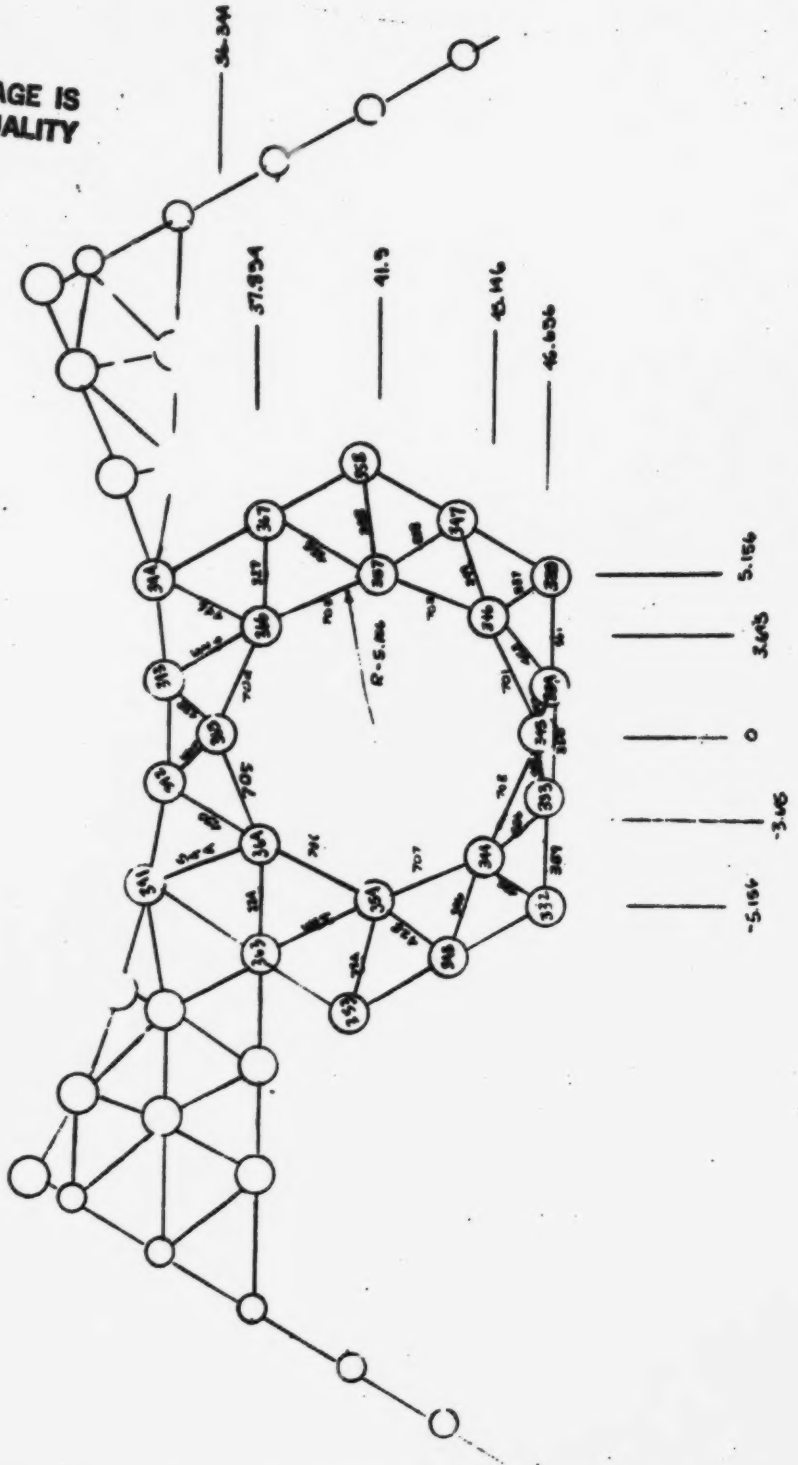


PANEL 3 - UPPER PANEL, BAY 4

FORM LMSC 592 B-3

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4.1 MODEL DESCRIPTION (CONT'D)

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PANEL 4 ~ AVIONICS PANEL - ALL 6 BAYS

GRID NO. & TRIA NO. = (BAY NO) x 1,000 + LAYOUT NO.

BAR NO. = (BAY NO.) x 10,000 + (PANEL NO) x 1,000 + LAYOUT NO.

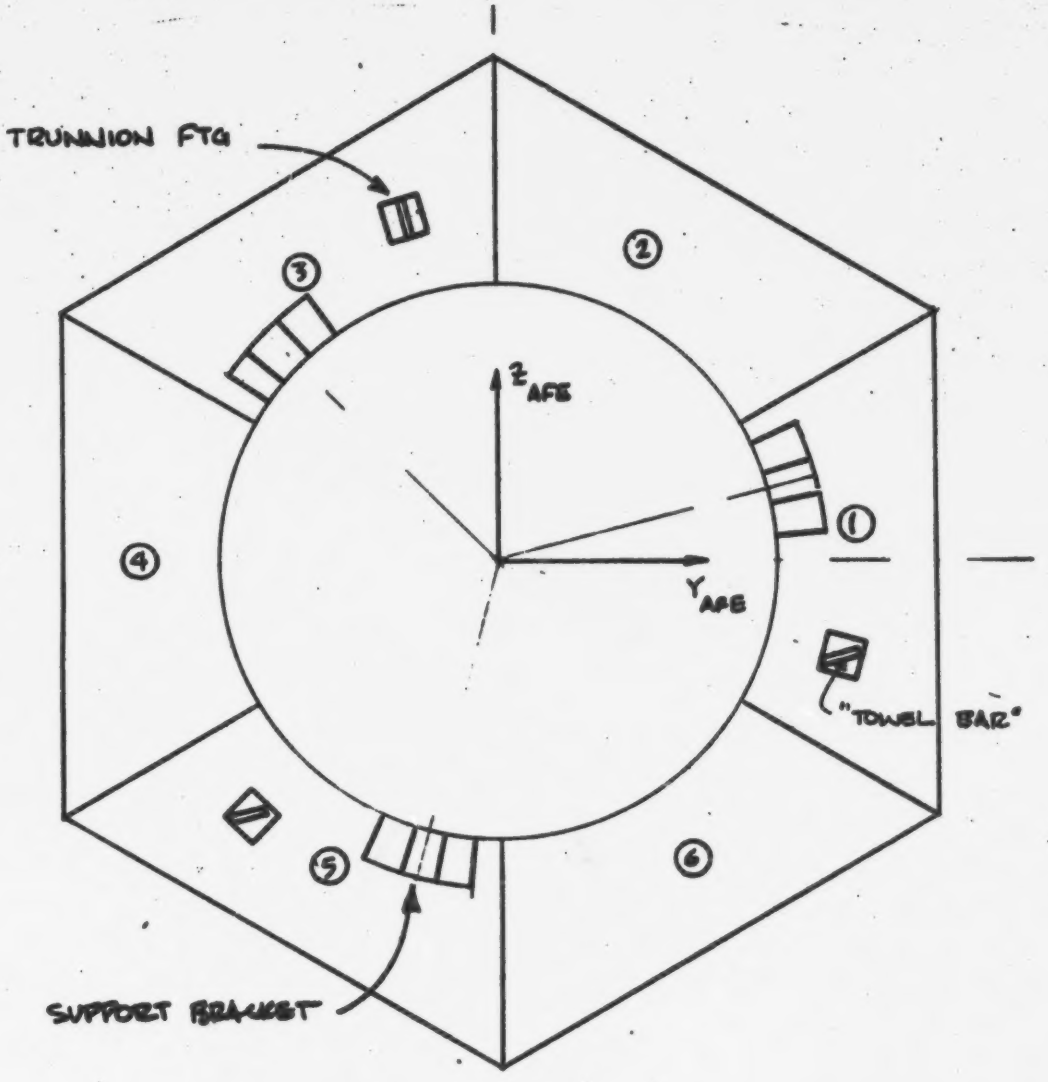



* GRID NO. = (BAY NO) x 10,000 + 1,000 + LAYOUT NO

** GRID NO. = (BAY NO) x 10,000 + LAYOUT NO.

FORM LMSC 363 8-3

## 4.1 MODEL DESCRIPTION (CONT'D)




(X) ⇒ BAY NO.

CARRIER VEHICLE PLAN VIEW SHOWING LOCATION AND ORIENTION OF SRM SUPPORT BRACKETS AND TRUNNION FITTINGS.

| Prepared by | Date | LOCKHEED MISSILES & SPACE COMPANY, INC. | Page |
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4.1 MODEL DESCRIPTION (CONT'D)

- SRM UPPER BRACKET (TYPICAL BAYS 1, 3, 5)

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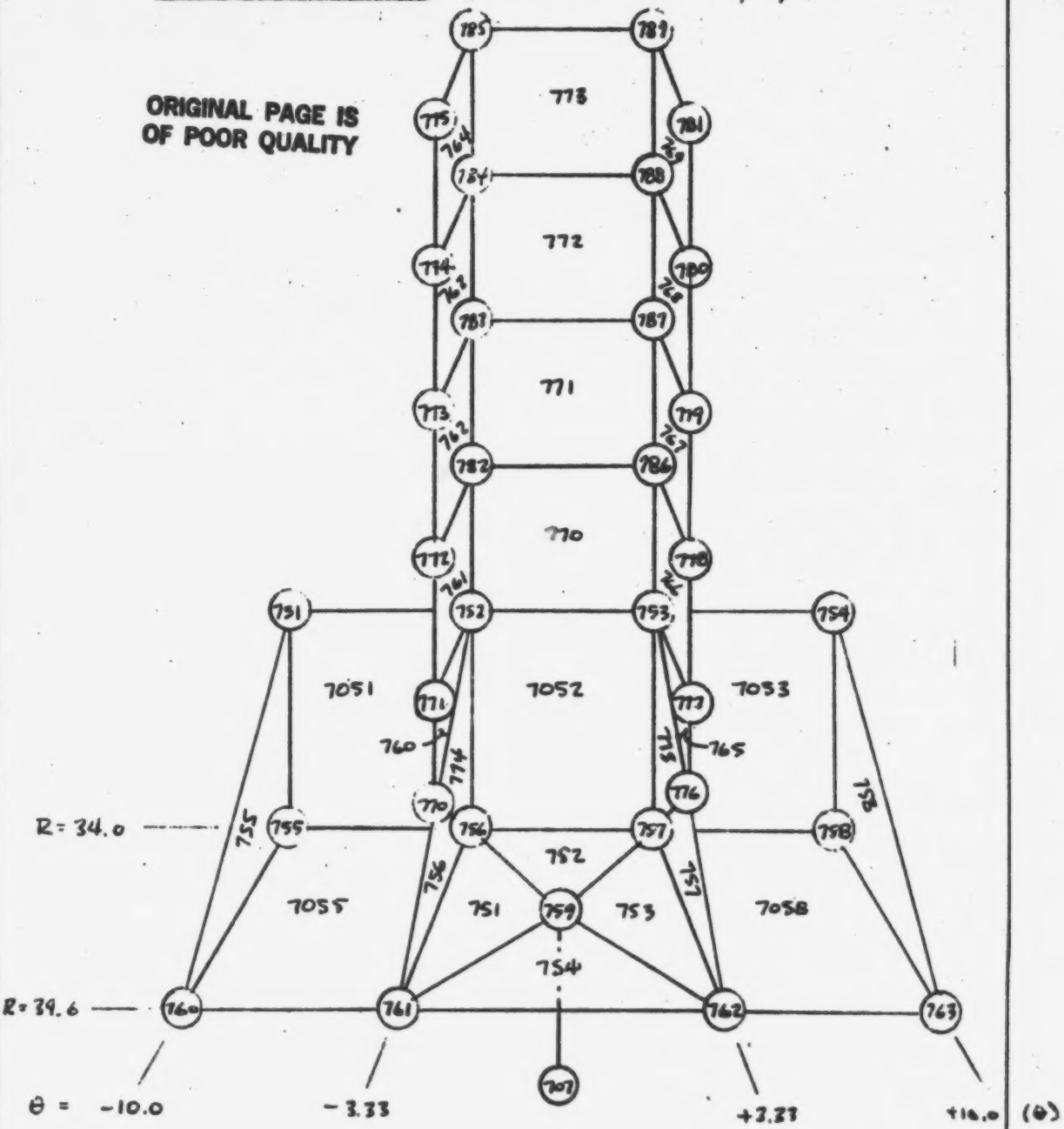


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|---|---|---|---|
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4.1 MODEL DESCRIPTION (CONT'D)

- SRM LOWER BRACKET (PEDESTAL) - TYPICAL BAYS 1, 3, 5

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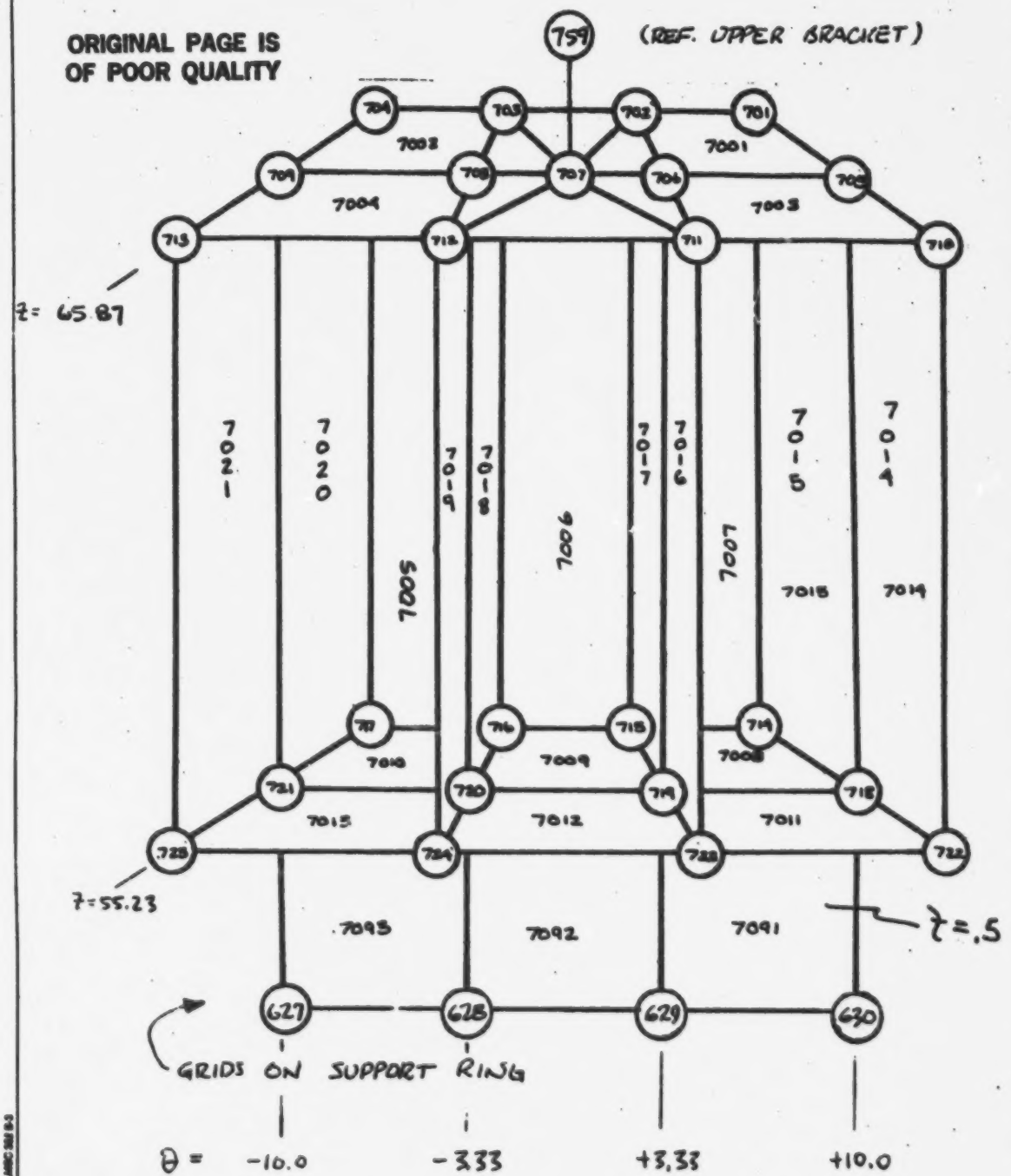

4.1 MODEL DESCRIPTION (CONT'D)

SRM SUPPORT RING CROSSECTION (@ $\theta = -30°$)

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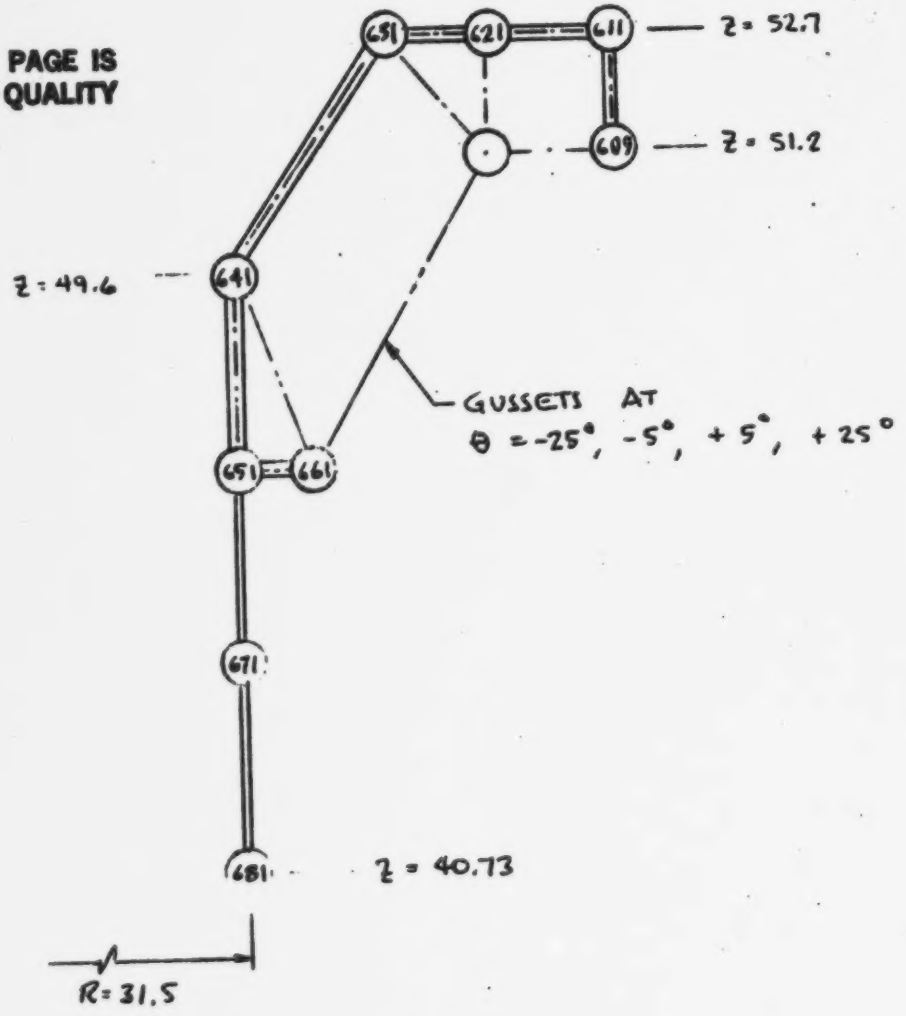
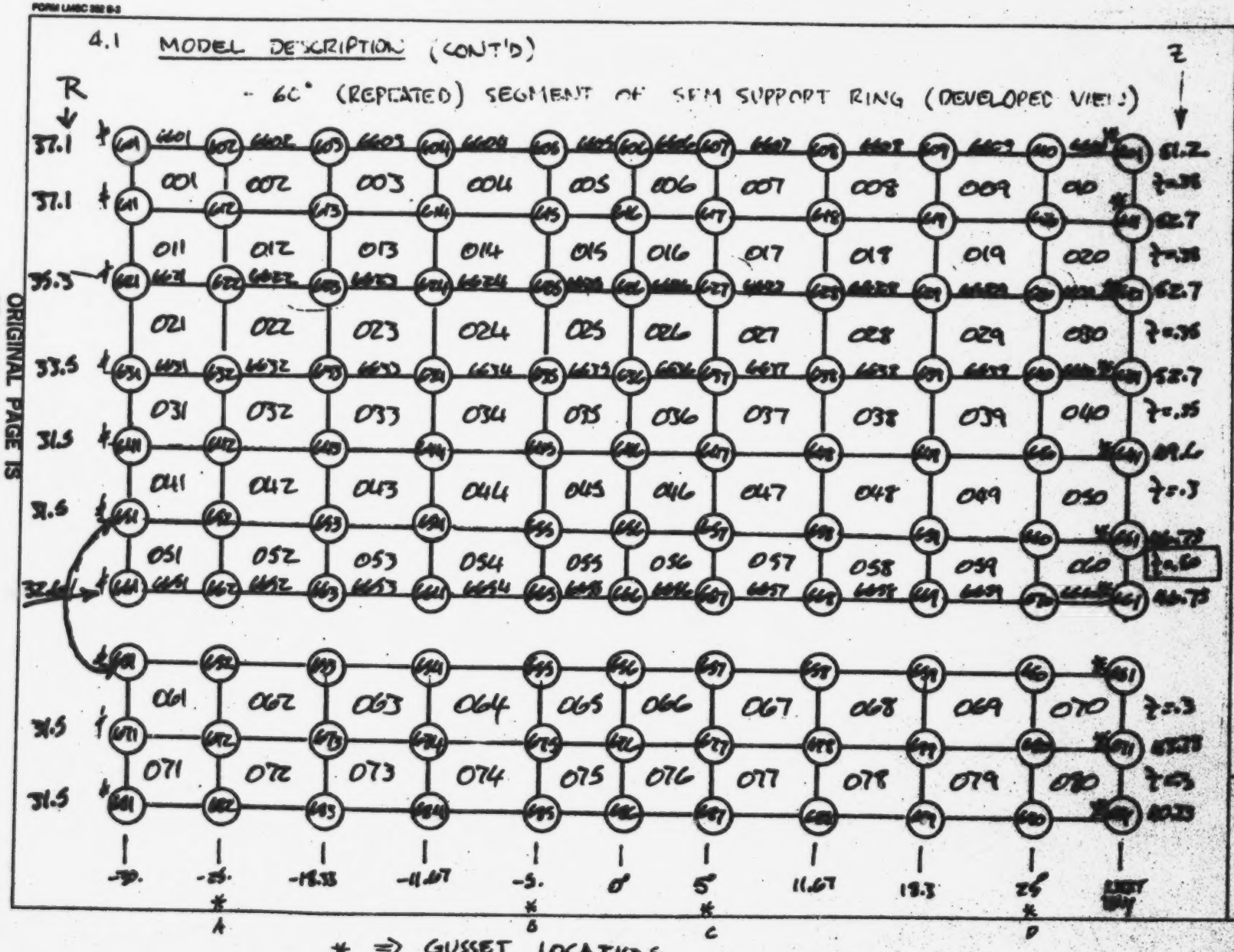


4.1 MODEL DESCRIPTION (CONT'D)

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LOCKHEED MISSILES & SPACE COMPANY, INC.

ASE CARRIER VEHICLE

STRESS ANALYSIS

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|---|---|---|---|
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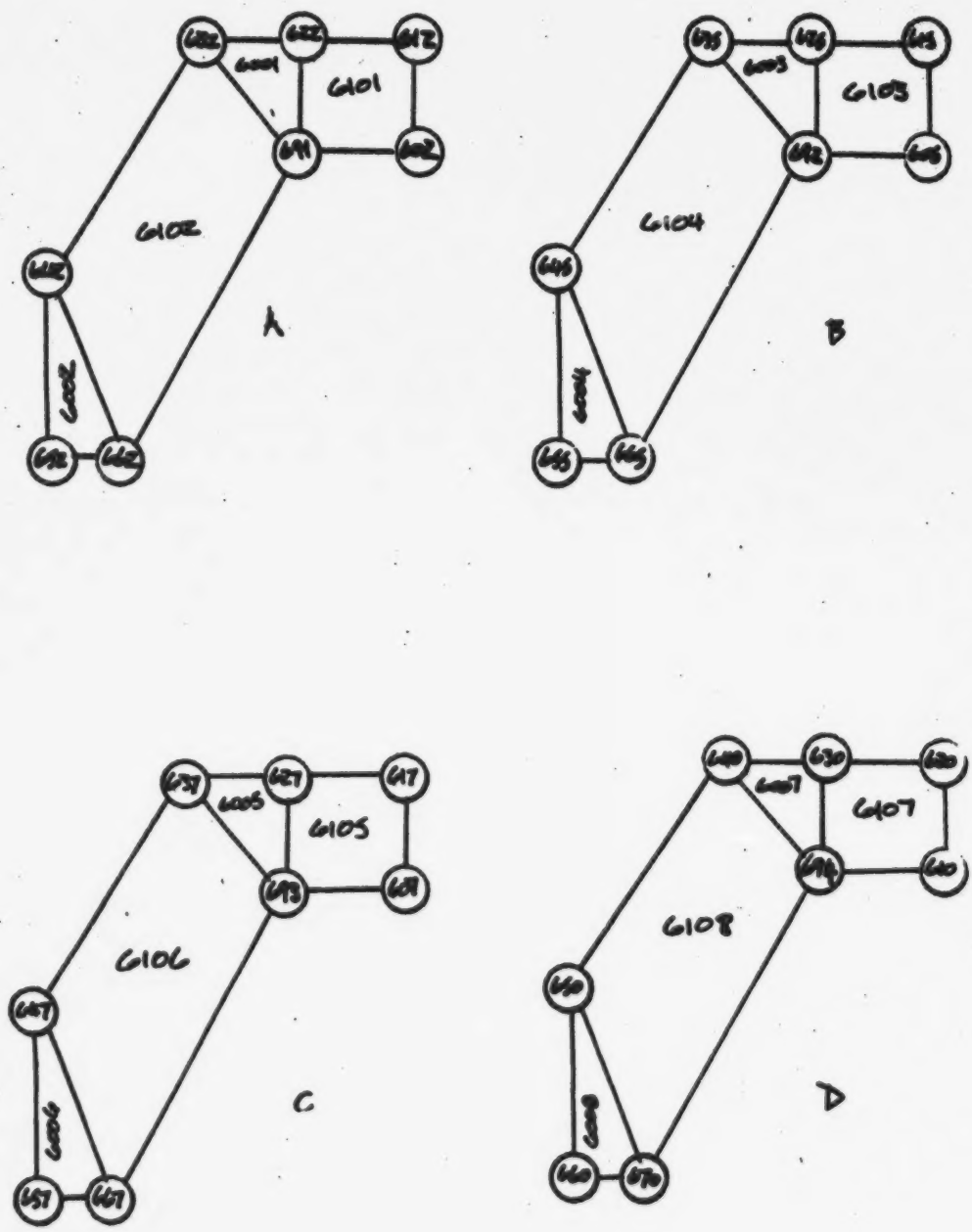
| Approved by | Date | | Report No |

4.1 MODEL DESCRIPTION (CONT'D)

- SUPPORT RING GUSSETS




FORM LMSC 382 8-3

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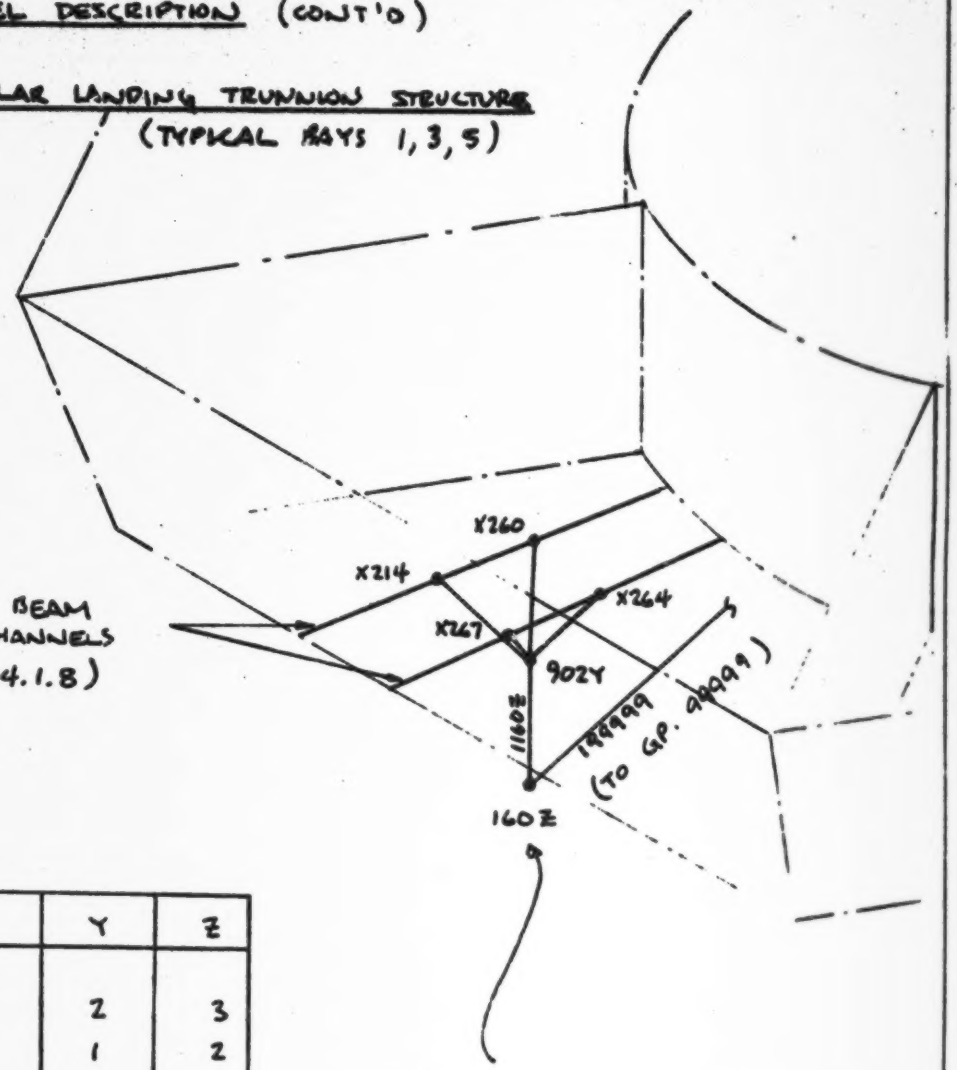
## 4.1 MODEL DESCRIPTION (CONT'D)

- REGULAR LANDING TRUNNION STRUCTURE (TYPICAL BAYS 1, 3, 5)




TRUNNION BEAM SUPPORT CHANNELS (REF PG. 4.1.8)

| BAY | X | Y | Z |
|---|---|---|---|
| 1 | 1 | 2 | 3 |
| 3 | 3 | 1 | 2 |
| 5 | 5 | 0 | 1 |

CRIGD 19999 TRANSFERS LOADS TO 160Z IN VERTICAL AND TRANSLATIONAL DIRECTIONS (NORMAL TO AXIS OF "TOWEL BAR"). SEE PAGE PG. 4.1.14 FOR ORIENTATION OF "TOWEL BAR" IN EACH BAY.

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FORM LMSC 2813

## 4.2 LOAD CONDITIONS

There are presently five load conditions which have been run on these models. Three (Liftoff, Landing Abort, and Regular Landing) are high-g cases which produce internal loads in the Carrier Vehicle from the accelerations of the mounted components and mass of the structure. These three conditions were selected from the ten conditions given in Table 4.2.1 - AFE PRELIMINARY DESIGN LOAD FACTORS (presented below) as the critical cases which envelope all others. The other two conditions are the application of the Thruster forces when the AFE is in flight. One of these is with the SRM still attached and one with the SRM already jettisoned. The assumption made with each of these two conditions is that all Thrusters are acting at once and that the Thrusters are the only forces active during that instant. The purpose in applying these Thruster conditions was to evaluate the local structure in the near vicinity of each of the Thruster groups. The Thruster forces are of such low magnitude that no significant stresses result in the Carrier Vehicle other than at the local backup structure.

TABLE 4.2.1 AFE PRELIMINARY DESIGN LOAD FACTORS

| Flight Condition | Load Factor, g | | | Angular Acceleration, rad/sec$^2$ | | |
|---|---|---|---|---|---|---|
| | Nx | Ny | Nz | $\ddot{\theta}x$ | $\ddot{\theta}y$ | $\ddot{\theta}z$ |
| Lift-Off | -0.4<br>-4.0 | ±1.4 | ±2.5 | ±10.0 | ±20.0 | ±10.0 |
| Ascent | -1.10<br>-3.17 | ±0.4 | +0.25<br>-0.80 | ±0.2 | ±0.25 | ±0.25 |
| Descent | +1.01<br>-0.15 | ±2.5 | +2.5<br>-1.0 | ±1.28 | +0.02<br>-0.11 | ±0.25 |
| *SRM Burn | TBD | TBD | TBD | TBD | TBD | TBD |
| *Aeropass | TBD | TBD | TBD | TBD | TBD | TBD |
| Landing Normal (9.6 fps) | ±2.5 | ±1.5 | +6.2<br>-1.7 | ±10.0 | ±15.1 | ±10.0 |
| Landing Abort (6.0 fps) | ±1.6 | ±1.3 | +3.9<br>-1.1 | ±8.3 | ±9.4 | ±6.3 |
| Emergency Landing (Ultimate Load) | +4.5<br>-1.5 | ±1.50 | +4.5<br>-2.0 | | | |
| On-Orbit RRCS | +.017<br>-.009 | ±.009 | +.039<br>-.029 | ±.019 | +.023<br>-.015 | ±.013 |
| OMS Operation | -.273 | ±.0048 | -.089 | ±.0104 | ±.0051 | ±.0045 |

Notes: * For subsequent stress analysis of internal loads, the signs of the table should be reversed.

## 4.2 LOAD CONDITIONS (CONT'D)

The method of solution as discussed previously, involves using an inertial relief solution in NASTRAN that depends on an accurate representation in the model of the vehicle mass and inertia properties. The structural mass for the Carrier Vehicle panels, splice section bars and cylinder were calculated from an input density and the crossectional areas specified on the property cards. The non-structural mass for the mounted equipment, the SRM, and the aerobrake were assigned via CONM2 cards at the location given in the mass properties table. The NASTRAN program calculates and provides a summary of the total model mass and moment of inertia when the program executes. As can be seen in the following table, the agreement between the model and the original mass property estimates is very close.

TABLE 4.2.2 MASS PROPERTIES SUMMARY TABLE

*AFE WITH SRM*

| | WT DOCUMENT | NASTRAN MODEL | % DIFFERENCE |
|---|---|---|---|
| MASS (lb) | 12540.4 | 12534.3 | 0.05 |
| INERTIAS (slug-ft$^2$) | | | |
| Ixx | 2525.6 | 2540.6 | -0.59 |
| Iyy | 1911.6 | 1921.3 | -0.51 |
| Izz | 1798.1 | 1826.2 | -1.56 |

*AFE W/O SRM*

| | WT DOCUMENT | NASTRAN MODEL | % DIFFERENCE |
|---|---|---|---|
| MASS (lb) | 3567.4 | 3585.2 | -0.50 |
| INERTIAS (slug-ft$^2$) | | | |
| Ixx | 1726.4 | 1742.9 | -0.96 |
| Iyy | 1106.2 | 1105.5 | 0.06 |
| Izz | 980.8 | 1010.7 | -3.05 |

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|---|---|---|---|
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| Approved by | Date | | Report No. |

5.1 AEROBRAKE ATTACH FITTING ANALYSIS

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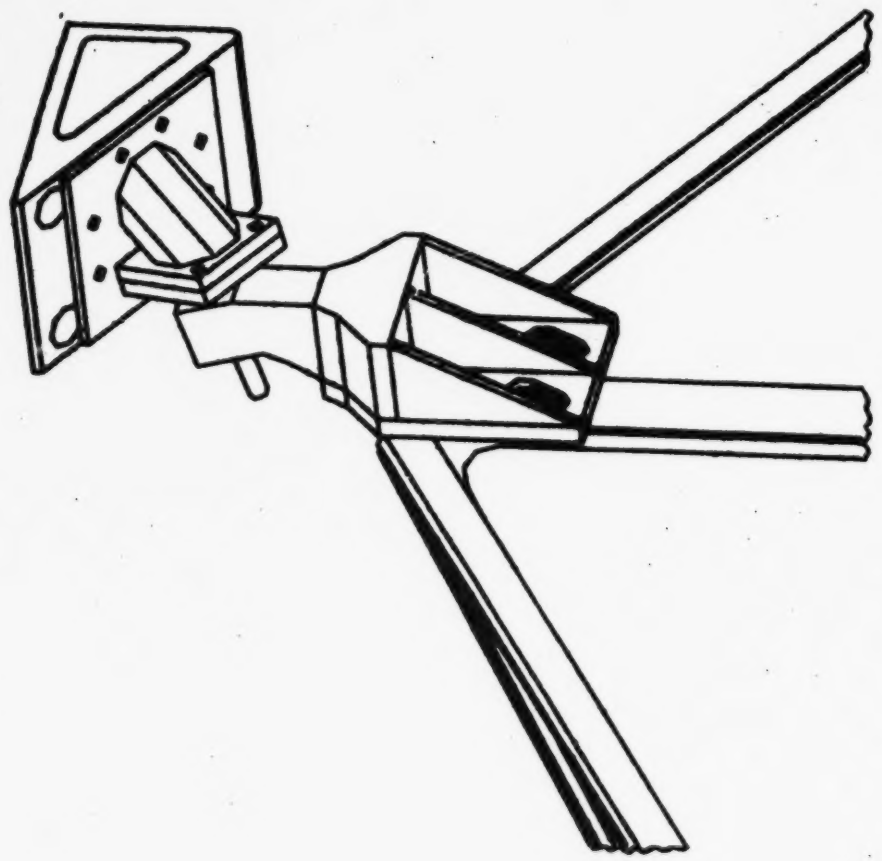
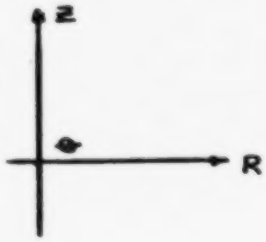


FORM LMSC 362 B 3

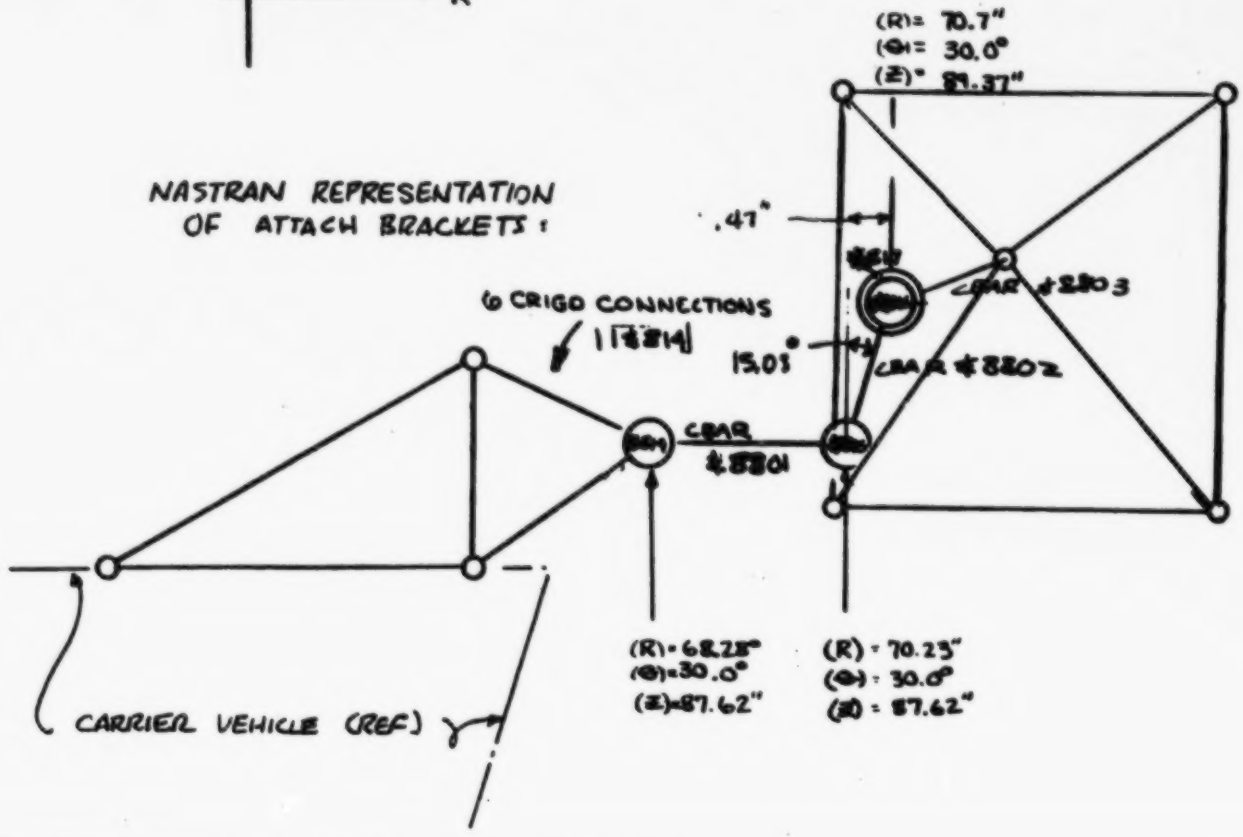
FORM LMSC 262 B-3

## 5.1 AEROBRAKE ATTACH FITTING ANALYSIS

- NASTRAN ELEMENTS REPRESENTING ATTACH FITTINGS




NASTRAN REPRESENTATION OF ATTACH BRACKETS:

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Checked by: Date:
Approved by: Date:

LOCKHEED MISSILES & SPACE COMPANY, INC.

Title: ACE CARRIER VEHICLE STRESS ANALYSIS

Model: ACE
Report No.

Page: 5.1-2

## 5.1 AEROBRAKE ATTACH FITTING ANALYSIS (CONT'D)

### AEROBRAKE ATTACH BRACKET BAR KBB01 FORCES ~ LIFT-OFF CONDITION

| BRACKET LOCATION | CBAR ELEM | END | $M_1$ | $M_2$ | $V_1$ | $V_2$ | P | T |
|---|---|---|---|---|---|---|---|---|
| • BAY 1/6 | 18801 | a | 9,435.9 | -3,208.8 | 3,671.7 | -1,326.0 | -316.3 | -2,319.8 |
| | | b | 2,276.0 | -623.0 | | | | |
| BAY 1/2 | 28801 | a | -8,306.4 | -6,536.5 | -4,826.4 | -2,701.3 | -1,926.9 | -4,724.7 |
| | | b | 1,105.1 | -1,268.9 | | | | |
| • BAY 3/4 | 48801 | a | -9,754.8 | 6,080.6 | -5,107.8 | 2,513.1 | -1,486.8 | 4,394.0 |
| | | b | 205.4 | 1,180.1 | | | | |
| BAY 4/5 | 58801 | a | 7,237.8 | 5,056.4 | 3,744.4 | 2,090.1 | 1,041.8 | 3,651.9 |
| | | b | -63.7 | 980.8 | | | | |
| | | | | | $\Sigma =$ | -2,518.0 LB (VERT) | | |

• => MOST HIGHLY LOADED (CRITICAL) BRACKETS.

5.1 AEROBRAKE ATTACH FITTING STRESS ANALYSIS (CONT'D)

AEROBRAKE ATTACH BRACKET BAR X8801 FORCES ~ LANDING ABORT CONDITION

| BRACKET LOCATION | CBAR ELEM | END | $M_1$ | $M_2$ | $V_1$ | $V_2$ | P | T |
|---|---|---|---|---|---|---|---|---|
| BAY 1/6 | 18801 | a | -4,651.3 | 4,315.8 | -3,221.7 | 1,783.6 | -1,795.8 | 3,119.6 |
| | | b | 1,631.0 | 837.8 | | | | |
| BAY 1/2 | 28801 | a | 2,278.5 | 1,781.4 | 1,205.9 | 736.4 | 366.0 | 1,286.0 |
| | | b | -73.0 | 345.4 | | | | |
| BAY 3/4 | 48801 | a | 3,672.4 | -587.7 | 1,145.5 | -242.8 | -514.9 | -425.3 |
| | | b | 1,438.6 | -114.2 | | | | |
| BAY 4/5 | 58801 | a | -4,043.6 | -4,459.1 | -3,082.5 | -1842.7 | -1,951.5 | -3,223.9 |
| | | b | 1,967.3 | -865.8 | | | | |

$\Sigma = -3,952.8$ LB (VERT)

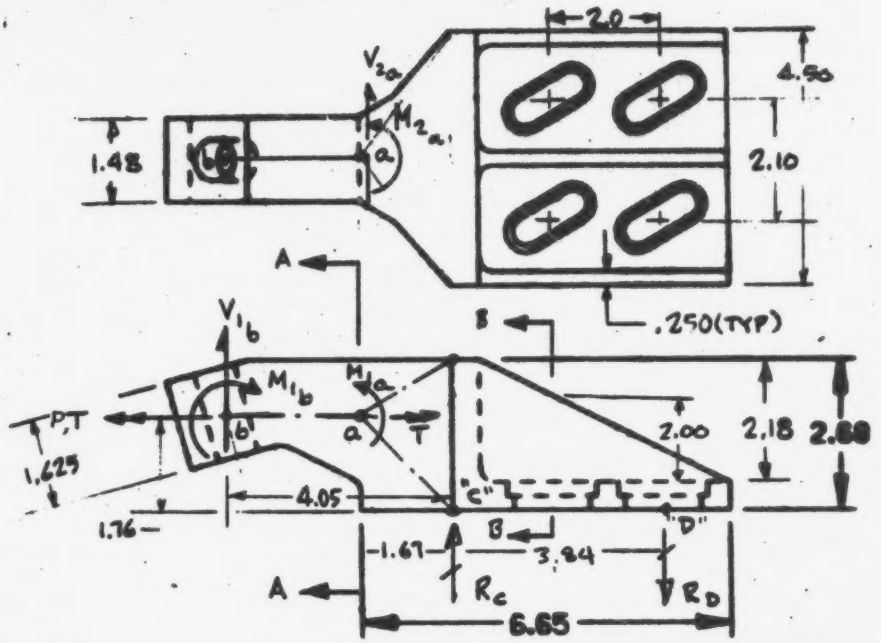
5.1 AEROBRAKE ATTACH FITTING ANALYSIS (CONT'D)

AEROBRAKE ATTACH BRACKET BAR X8801 FORCES ~ NORMAL LANDING CONDITION

| BRACKET LOCATION | CBAR ELEM | END | $M_1$ | $M_2$ | $V_1$ | $V_2$ | P | T |
|---|---|---|---|---|---|---|---|---|
| BAY 1/6 | 18801 | a | -7,919.9 | 5,190.4 | -4,677.7 | 2,145.1 | -1,940.6 | 3,751.5 |
| | | b | 1,201.6 | 1,007.6 | | | | |
| BAY 1/2 | 28801 | a | 611.7 | 3,425.4 | 1,286.9 | 1,415.9 | 1,430.9 | 2,473.8 |
| | | b | -1,897.8 | 664.4 | | | | |
| BAY 3/4 | 48801 | a | 5,266.6 | -1,561.6 | 2,060.0 | -645.2 | -161.4 | -1,129.9 |
| | | b | 1,249.5 | -303.5 | | | | |
| BAY 4/5 | 58801 | a | -9,083.5 | -5,407.8 | -5,194.6 | -2,234.7 | -1,992.0 | -3,909.9 |
| | | b | 1,046.0 | -1,050.1 | | | | |

$\Sigma = -6,525.4$ LB (VERT)

## 5.1 AEROBRAKE ATTACH FITTING ~ CV SIDE




$P_a$ = -1486.8 lb

$V_{1a} = V_{1b}$ = -5,107.8 lb

$M_{1a}$ = -9,754.8 in-lb

$M_{2a}$ = 6080.6 in-lb

$V_{2a} = V_{2b}$ = 2,513.1 lb

$T_a$ = 4394.0 in-lb

CRITICAL LOADS FOR END "a"
REF AFE NASTRAN MODEL
LIFT-OFF LOADS FOR
BAY 3/4 FTG (CBAR 48801)

$P_b$ = -316.3 lb
$V_{1b}$ = 3671.7 lb
$V_{2b}$ = -1326.0 lb
$M_{1b}$ = 2276.0 in-lb
$M_{2b}$ = -623.0 in-lb
$T_b$ = -2319.8 in-lb

CRITICAL LOADS FOR END "b"
REF. AFE NASTRAN MODEL
LIFT-OFF LOADS FOR
BAY 1/6 FTG (CBAR 18801)

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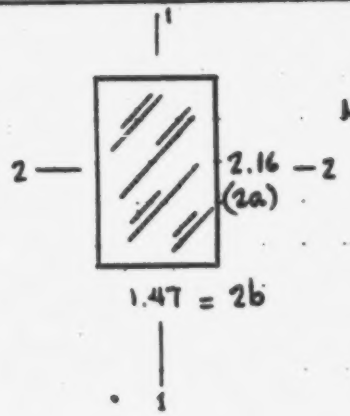
5.1 AEROBRAKE ATTACH FITTING ~ CV SIDE (CONT'D)

BENDING STRESSES AT SECTION A-A:




MIN DIMENSIONS:

$$I_1 = \frac{2.16(1.47)^3}{12} = .572 \text{ IN}^4$$

$$I_2 = \frac{1.47}{12}(2.16)^3 = 1.235 \text{ IN}^4$$

$$A = 1.47(2.16) = 3.175 \text{ IN}^4$$

$$k = ab^3\left[\frac{16}{3} - 3.36\frac{b}{a}\left(1 - \frac{b^4}{12a^4}\right)\right]$$

$$k = 1.324$$

$$f_b = \frac{P}{A} + \frac{M_1 C_2}{I_1} + \frac{M_2 C_1}{I_2}$$

$$f_b = \frac{-1486.8}{3.175} + \frac{(-9,754.8)(1.08)}{1.235} + \frac{(6080.6)(-.735)}{.572}$$

$$f_b = -16,812 \text{ psi}$$

$$MS_{y\ BEND.} = \frac{51.0^{*}}{(1.25)(16.8)} - 1 = \underline{+ \text{HIGH}}$$

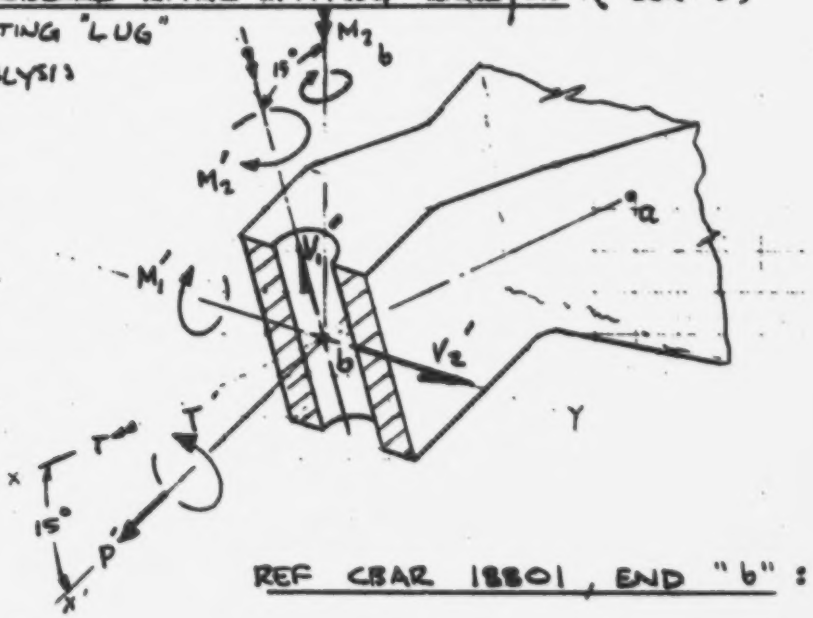
$$MS_{u\ BEND.} = \frac{63.0^{*\nabla}}{(2.0)(16.8)} - 1 = \underline{+.88}$$

$\nabla$ · USED $F_{tu}$ FOR ULTIMATE MARGIN ASSUMING LOADS CAN REVERSE.

* ASSUMES MAT'L TO BE 2219-T87 AL.

## 5.1 AEROBRAKE ATTACH FITTING ANALYSIS (CONT'D)

- FITTING "LUG" ANALYSIS:




REF CBAR 18801, END "b":

$M_1' = M_{1_b} = 2276.0$ in-lb

$M_2' = M_{2_b} \cos 15° - T \sin 15° \cong 0$ in-lb ✓

$T' = T \cos 15° + M_{2_b} \sin 15° = -2402.0$ in-lb

$V_2' = V_{2_b} = -1326.0$ lb

$V_1' = V_{1_b} \cos 15° + P \sin 15° = 3464.7$ lb

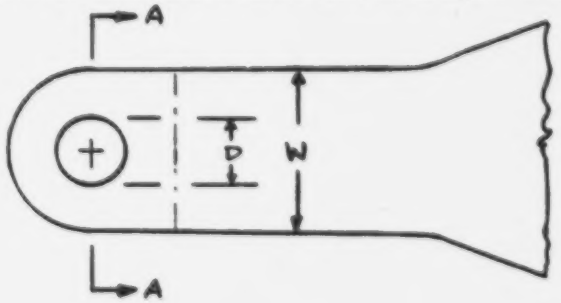
$P' = P \cos 15° - V_1 \sin 15° = -1255.8$ lb

ANALYZE BENDING + AXIAL STRESSES AS EQUIVALENT AXIAL STRESS:

⇨ REF. SM NO 1e:

LUG PARAMETERS:

W = 1.47" (MIN)
D = .75" (MAX)
t = 1.615" (MIN)

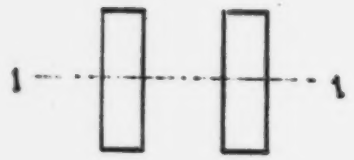


## 5.1 AEROBRAKE ATTACH FITTING ANALYSIS (CONT'D)

$\frac{W}{D} = 1.96 \Rightarrow k_{t_u} \simeq .835$ (REF FIG. 5a)

$\bar{P}_{tu} = k_t \cdot A_t \cdot F_{tu} = 61.2$ K

SECT A-A:




$I_1' = \frac{(1.47-.75)(1.615)^3}{12}$

$I_1' = .253$

$A_t = (1.47-.75)(1.615) = 1.163\ in^2$

$f_b = \frac{M_1' c_2'}{I_1'}$

$f_b = \frac{2276\ (.8075)}{.253}$

$f_b = 7264.3$ psi

$\bar{P}_t = 7264.3(A_t) = 8448.4$ lb

$\Rightarrow R_a = \frac{8448.4}{61,200}(2.0) = .276$

TRANSVERSE LOADING:

$\frac{a}{D} = \frac{W}{2D} = .98 \Rightarrow \frac{A_{av}}{A_{br}} = .565$ (REF FIG. 6c)

$K_{tr_y} = K_{tr_u} = .690$

$P_{tr} = K_{tru} \cdot A_{br} \cdot F_{tu}$

$P_{tr} = .69\ (1.211)(63.0) = 52.64$ K

$\bar{P}_{tr} = 8469.9\ (1.615)(.75) = 10,259$ K

$R_{tr} = \frac{\bar{P}_{tr}}{P_{tr}}(2.0)$

$\Rightarrow R_{tr} = \frac{(10.26)(2.0)}{(52.64)} = .390$

PIN-BEARING SECTION PROPERTIES:

$I_{BRG\ AREA} = \frac{.75(1.615)^3}{12} = .263\ in^4$

$A_{br} = .75(1.615) = 1.211\ in^2$

$f_{tr} = \frac{V_2'}{A_{br}} + \frac{T' c}{I_{br}}$

$f_{tr} = \frac{1326.0}{1.211} + \frac{(2402)(.8075)}{.263}$

$f_{tr} = 8469.9$ psi

5.1 AEROBRAKE ATTACH FITTING ANALYSIS (CONT'D)

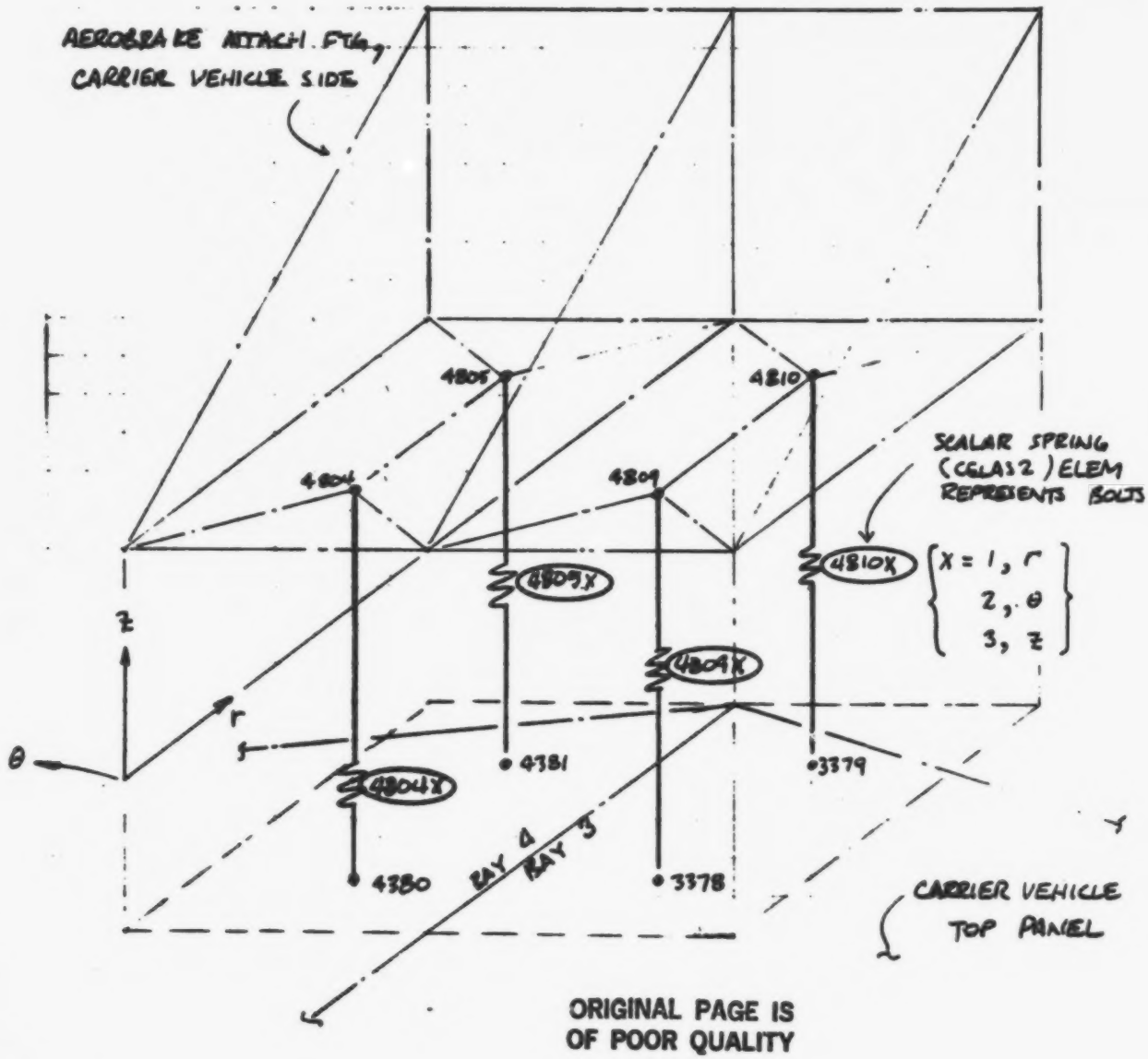
- "LUG" ANALYSIS (CONT'D)

AXIAL, TRANSVERSE LOADING INTERACTION EQUATION:

$$MS_u \text{ OBLIQUE LOADING} = \frac{1}{(R_a^{1.6} + R_{tr}^{1.6})^{.625}} - 1 = \underline{+.93}$$

AEROBRAKE / CARRIER VEHICLE ATTACH BOLTS

NASTRAN MODEL DETAIL OF ATTACH FTG TO CARRIER VEHICLE CONNECTION:

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5.1 AEROBRAKE ATTACH FITTING ANALYSIS (CONT'D)

- FITTING / CARRIER VEHICLE ATTACH BOLTS

SUMMARY OF CELAS2 SPRING FORCES FOR LIFTOFF CONDITION *

(LIMIT. FORCES IN Lb).

| CELAS2 ELEM. | X = | $F_r$ (1) | $F_\theta$ (2) | $F_z$ (3) |
|---|---|---|---|---|
| 4804X | | 1,755.2 | 1,851.0 | 7,8[illegible]4 |
| 4805X | | 1.926.2 | -2,816.0 | -5,962.8 |
| 4809X | | -2,172.0 | 1,646.3 | 6,529.3 |
| 4810X | | -2,977.9 | -3,341.4 | -13,166.9 ⇦ |
| $\Sigma$ = | | -1,468.5 | -2,660.1 | -5,114.0 |

CRITICAL FASTENER IS 4810 X

TOTAL SHEAR, $V = \left[(2977.9)^2 + (3341.4)^2\right]^{1/2} = 4475.8$ Lb

"TENSION" ** = $F_z = 13,166.9$ Lb

ASSUMING FASTENER SELECTED IS 1/2" DIA 180 KSI - TENSION (108 KSI - SHEAR) MS 21250 TENSION BOLT OR EQUIV:

$$P_{t_u} = 180\left(\frac{\pi}{4}D^2\right) = 35.343 \text{ KIP}$$

$$P_{s_u} = 108\left(\frac{\pi D^2}{4}\right) = 21.206 \text{ KIP}$$

$$R_t = \frac{2.0(13,167)}{35.343} = .745$$

$$R_s = \frac{2.0(4,476)}{21.206} = .422$$

** ASSUMING LOADS CAN BE REVERSIBLE.

* DETERMINED TO BE MOST CRITICAL CONDITION FOR THIS STRUCTURE

3.1 AEROBRAKE ATTACH FITTING ANALYSIS (CONT'D)

- FITTING / CARRIER VEHICLE ATTACH BOLT ANALYSIS (CONT'D)

BOLT TENSION, SHEAR INTERACTION:

(REF NASA STRUCTURES MANUAL, TABLE A.3.4.0-1)

$$K^3 R_s^3 + K^2 R_t^2 = 1$$

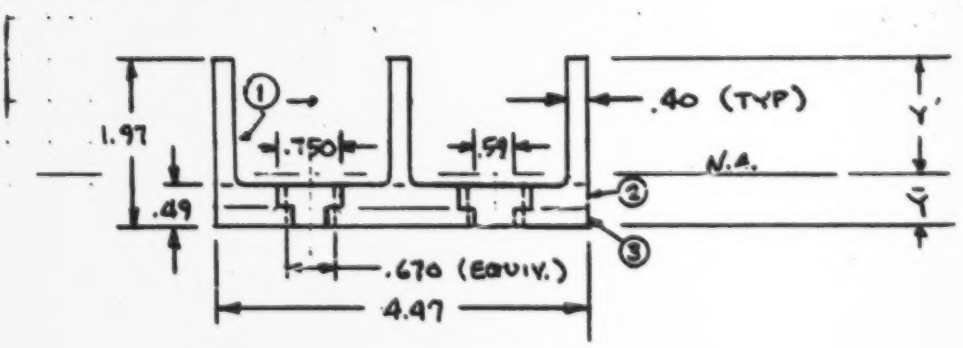
$$K^3(.422)^3 + K^2(.795)^2 = 1$$

BY TRIAL, $K = 1.24$

$$MS_{\text{TENS-SHEAR}} = K - 1 = \underline{+.24}$$

BENDING ANALYSIS OF ATTACH FTG, (CV SIDE)

REF SECTION B-B, PG 3.1.6:




| ELEM | A | Y | AY | $AY^2$ | $I_o$ |
|---|---|---|---|---|---|
| ① | 1.7760 | 1.2300 | 2.1845 | 2.6869 | .3242 |
| ② | .7277 | .3675 | .2674 | .0983 | .0036 |
| ③ | .8061 | .1225 | .0987 | .0121 | .0040 |
| Σ | 3.3098 | | 2.5506 | 2.7973 | .3318 |

$$\bar{Y} = \frac{\Sigma AY}{\Sigma A} = \frac{2.5506}{3.3098} = .7706 \text{ IN}$$

$$I_c = \Sigma Ay^2 + \Sigma I_o - (\Sigma A)(\bar{Y})^2 = 1.1636 \text{ IN}^4$$

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5.1 AEROBRAKE ATTACH FITTING ANALYSIS (CONT'D)
BENDING ANALYSIS OF CV FITTING (CONT'D)

$$f_b = \frac{M_y'}{I} = \frac{(7486.4 + 6929.8)(2.0)(1.97-.771)}{1.164}$$

$$f_b = 28,874 \text{ psi}$$

$$MS_{y\ BEND.} = \frac{51.0}{1.25(28.9)} - 1 = \underline{+.41}$$

$$MS_{u\ BEND} = \frac{63.0}{2.0(28.9)} - 1 = \underline{+.09}$$

ALLOWABLE CRIPPLING STRESS OF UP-STANDING FLANGE
(ONE EDGE FREE)
(REF NASA STRUCTURES MANUAL, SECT 4.21)

$$F_{cc} = \frac{C_e \sqrt{F_{cy} \cdot E_c}}{(b/t).75}$$

$$F_{cc} = \frac{.275(51E3 \cdot 10.8E6)^{1/2}}{\left(\frac{1.97-.567}{.40}\right).75}$$

$F_{cc} = 79.6$ KSI $\Rightarrow$ CRIPPLING O.K.

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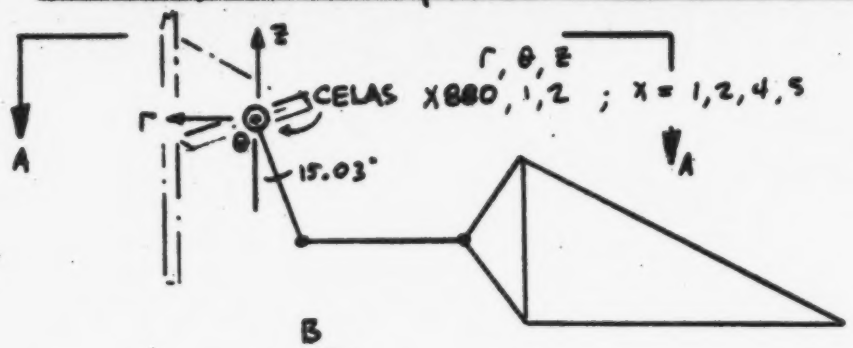
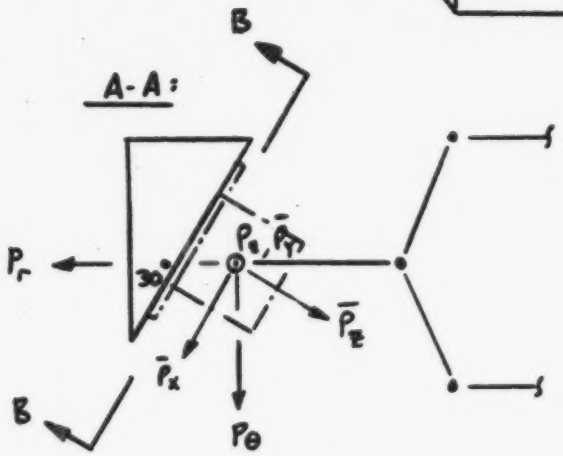
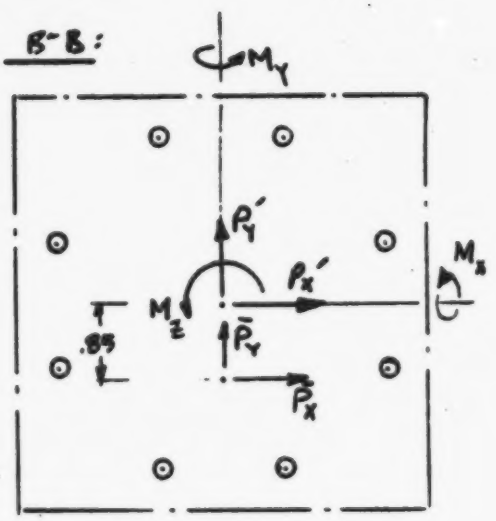
## 5.1 ATTACH FITTING ANALYSIS - AEROBRAKE SIDE

### SUMMARY OF BALL & SOCKET TRANSLATIONAL FORCES




$$\bar{P}_x = P_\theta \cos 30^\circ + P_r \sin 30^\circ$$

$$\bar{P}_z = P_\theta \sin 30^\circ - P_r \cos 30^\circ$$

$$\bar{P}_Y = P_z$$

$$M_z = \bar{P}_x (.85)$$

### I. LIFTOFF:

| BAY | $P_r$ | $P_\theta$ | $P_z$ | $\bar{P}_x$ | $\bar{P}_Y$ | $\bar{P}_z$ | M |
|---|---|---|---|---|---|---|---|
| 1/c | 313.3 | -1,325.3 | -3,672.6 | -991.1 | -3672.6 | -934.0 | -842.4 |
| 1/2 | 1,927.2 | -2,699.1 | 4,822.8 | -1373.9 | 4822.8 | -3018.6 | -1167.8 |
| 3/4 | 1,489.7 | 2,509.8 | 5,105.1 | 2918.4 | 5105.1 | -35.2 | 2480.6 |
| 4/5 | -1,042.1 | 2085.2 | -3744.2 | 1284.8 | -3744.2 | 1945.1 | 1092.1 |

AFE CARRIER VEHICLE
STRESS ANALYSIS



## II LANDING ABOART

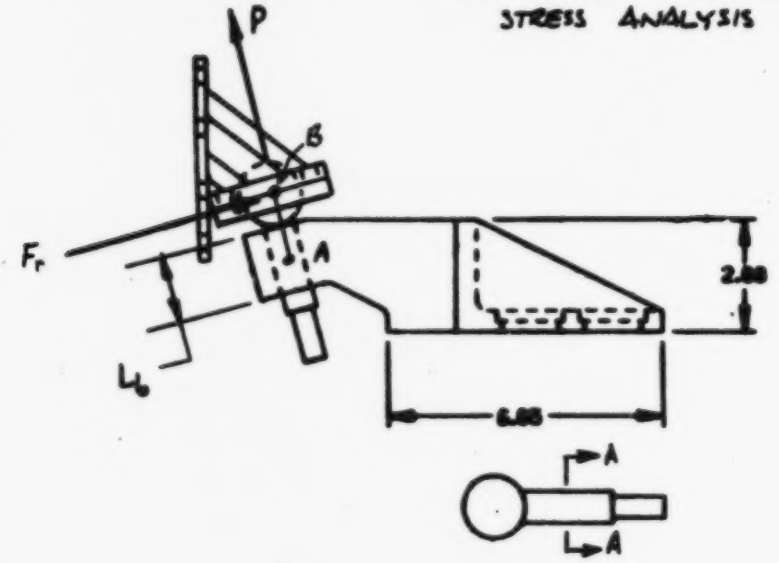
| BAY | $P_r$ | $P_\theta$ | $P_z$ | $\bar{P}_x$ | $\bar{P}_y$ | $\bar{P}_z$ | M |
|---|---|---|---|---|---|---|---|
| 1/6 | 1797.2 | 1782.2 | 3218.9 | 2442.0 | 3218.9 | -665.3 | 2075.7 |
| 1/2 | -365.8 | 734.0 | -1207.3 | 452.8 | -1207.3 | 683.8 | 384.9 |
| 3/4 | 513.4 | -243.1 | -1148.2 | 46.2 | -1148.2 | -566.2 | 39.3 |
| 4/5 | 1951.2 | -1842.0 | 3078.4 | -619.6 | 3078.4 | -2610.8 | -526.7 |

## III REGULAR LANDING

| BAY | $P_r$ | $P_\theta$ | $P_z$ | $\bar{P}_x$ | $\bar{P}_y$ | $\bar{P}_z$ | M |
|---|---|---|---|---|---|---|---|
| 1/6 | 1942.7 | 2143.1 | 4672.8 | 2827.3 | 4672.8 | -610.9 | 2403.2 |
| 1/2 | -1430.4 | 1412.5 | -1289.6 | 508.1 | -1289.6 | 1945.0 | 431.9 |
| 3/4 | 159.3 | -645.9 | -2064.2 | -479.7 | -2064.2 | -460.9 | -407.7 |
| 4/5 | 1991.6 | -2233.9 | 5188.3 | -938.8 | 5188.3 | -2841.7 | -798.0 |

TOM 3-10-88 5.1.16

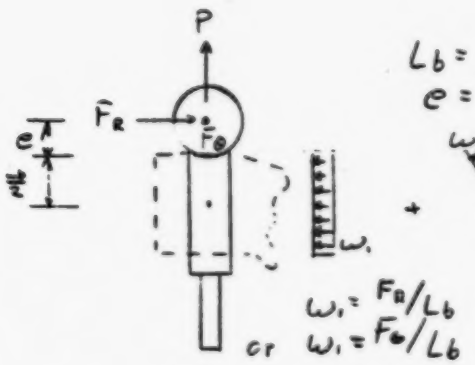
AFE CARRIER VEHICLE STRESS ANALYSIS AFE




Section A-A

$I_{xx} = I_{yy} = 1/4\ \pi (.375)^4 = 1.55\ E\text{-}2$ in⁴

$A = \pi r^2 = \pi (.375)^2 = 4.42E\text{-}1$ in²




$L_b$ = length of bearing = 1.60"

$e = 0.85$"

$\left[\frac{1}{2}\left(\frac{1.60}{2}\right)\omega_2\left(\frac{1.60}{3}\right)\right] 2 = F_R(1.65)$

$0.4267\ \omega_2 = M$

$\omega_2 = 2.34\ M$

$\omega_1 = F_R / L_b$

or $\omega_1 = F_\theta / L_b$

where $M = F_R (1.65)$

or $M = F_\theta (1.65)$

element X8RC2, X = 1, 2, 4, 5, ball at end B

$\omega_{max} = \omega_1 + \omega_2$

$\omega_{min} = \omega_2 - \omega_1$

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AFE CARRIER VEHICLE STRESS ANALYSIS AFE

5.1 AEROBRAKE ATTACH FITTINGS ANALYSIS (CONT'D)

$$\frac{X}{L_b - X} = \frac{\omega_{max}}{\omega_{min}}$$

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$$X\omega_{min} = (L_b - X)\omega_{max}$$

$$X(\omega_{min} + \omega_{max}) = L_b\omega_{max}$$

$$X = \frac{L_b\omega_{max}}{\omega_{max} + \omega_{min}} = \text{constant} = \frac{1.60(8193)}{(8193+5910)} = 0.93 \text{ in}$$

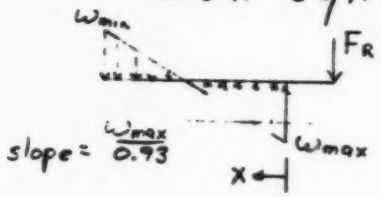
| FRESULTANT | Load Case | | |
|---|---|---|---|
| Bay ↓ | I | II | III |
| 1/6 | 1826 | 1997 | 2244 |
| 1/2 | 2768 * | 736 | 1759 |
| 3/4 | 2513 | 830 | 945 |
| 4/5 | 2087 | 2138 | 2308 |

* highest F

If X is measured as shown, $0 \le X \le 0.93$ in

shear eq'n $V = -F_R + \frac{1}{2}\left[\omega_{max} + \left(\omega_{max} - X\left(\frac{\omega_{max}}{0.93}\right)\right)\right]X$

$$= -F_R + \omega_{max}X - \frac{X^2\omega_{max}}{1.86}$$




$M_{max}$, $(V = 0)$: $0 = -2768 + 12416X - \frac{X^2(12416X)}{1.86}$

$$6675X^2 - 12416X + 2768 = 0$$

$X = 1.60$ ✓

$X = 0.259$ ← use

$M_{max} = 2768 \text{ lb}(0.85 + 0.259) = 3.07$ k-in

$$f_b = \frac{P}{A} + \frac{Mc}{I}$$

5.1 AEROBRAKE ATTACH FITTING ANALYSIS (CONT'D)
- ATTACH PIN ANALYSIS (CONT'D)

$$f_b = \frac{5159}{0.442} + \frac{3.07E3(3/8)}{1.55E-2} = 85.9 \text{ ksi}$$

Assuming A286 steel pin 180 ksi = $F_{tu}$

$$MS_u = \frac{180}{2.0(85.9)} - 1 = +0.05$$

$$MS_y = \frac{163}{1.25(85.9)} - 1 = +0.52$$

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|---|---|---|---|---|---|---|
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| Approved by: | | Date | | ACE CARRIER VEHICLE STRESS ANALYSIS | Report No. | |

5.1 AEROBRAKE ATTACH FITTING ANALYSIS (CONT'D)

- SUMMARY OF RESULTANT PIN BEARING LOADS

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I LIFTOFF

| Bay | P | $F_R$ | $F_\theta$ | $F_R$ | | | | $F_\theta$ | | | | Resultant | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $w_1$ | $w_2$ | $w_{max}$ | $w_{max}$ | $w_1$ | $w_2$ | $w_{max}$ | $w_{max}$ | $w_{max}$ | $w_{max}$ |
| 1/6 | 3466.1 | 1256.1 | 1135.6 | 785.1 | 4849.8 | 5635 | 4065 | 829.5 | 5118.1 | 5947 | 4290 | 8193 | 5910 |
| 1/2 | 5158.7 | 609.9 | 2699.8 | 381.2 | 2354.8 | 2736 | 1974 | 1682.4 | 10,424 | 12111 | 8737 | 12416 | 8967 |
| 3/4 | 5317.4 | 113.4 | 2510.9 | 70.9 | 432.8 | 509 | 367 | 1569.3 | 9695 | 11264 | 8126 | 11275 | 8134 |
| 4/5 | 3886.4 | 35.2 | 2086.8 | 22.0 | 135.9 | 158 | 114 | 1304.3 | 8057 | 9361 | 6753 | 9362 | 6754 |

II LANDING ABORT

| Bay | P | $F_R$ | $F_\theta$ | $F_R$ | | | | $F_\theta$ | | | | Resultant | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $w_1$ | $w_2$ | $w_{max}$ | $w_{max}$ | $w_1$ | $w_2$ | $w_{max}$ | $w_{max}$ | $w_{max}$ | $w_{max}$ |
| 1/6 | 3575.7 | 900.1 | 1782.7 | 562.6 | 3475.3 | 40329 | 2913 | 1114.2 | 6883.0 | 7997 | 5769 | 8959 | 6463 |
| 1/2 | 1260.4 | 40.3 | 734.8 | 25.2 | 155.6 | 180.8 | 130.4 | 459.3 | 2837.1 | 3296 | 2378 | 3301 | 2382 |
| 3/4 | 974.8 | 793.9 | 243.0 | 496.2 | 3065.2 | 3561 | 2569 | 151.9 | 938.2 | 1090 | 786 | 3724 | 2687 |
| 4/5 | 3480.5 | 1085.7 | 1842.2 | 678.6 | 4191.9 | 4870.5 | 3513 | 1151.4 | 7112.7 | 8264 | 5961 | 9592 | 6919 |

III REGULAR LANDING

| Bay | P | $F_R$ | $F_\theta$ | $F_R$ | | | | $F_\theta$ | | | | Resultant | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $w_1$ | $w_2$ | $w_{max}$ | $w_{max}$ | $w_1$ | $w_2$ | $w_{max}$ | $w_{max}$ | $w_{max}$ | $w_{max}$ |
| 1/6 | 5018.1 | 663.1 | 2143.7 | 414 | 2560 | 2974 | 2146 | 1340 | 8277 | 9617 | 6937 | 10,046 | 7261 |
| 1/2 | 1615.7 | 1047.3 | 1413.6 | 655 | 4044 | 1699 | 3389 | 884 | 5458 | 6342 | 4574 | 7893 | 5693 |
| 3/4 | 1950.7 | 689.6 | 645.7 | 431 | 2663 | 3094 | 2232 | 404 | 2493 | 1897 | 2089 | 4239 | 3057 |
| 4/5 | 5529.3 | 1773 | 2134.2 | 361 | 2229 | 2590 | 1868 | 1396 | 8626 | 10032 | 7230 | 10351 | 7467 |

AFE CARRIER VEHICLE AFE
STRESS ANALYSIS

## 5.1 AEROBRAKE ATTACH FITTING ANALYSIS (CONT'D)

- AEROBRAKE SIDE ; ATTACH FASTENER ANALYSIS

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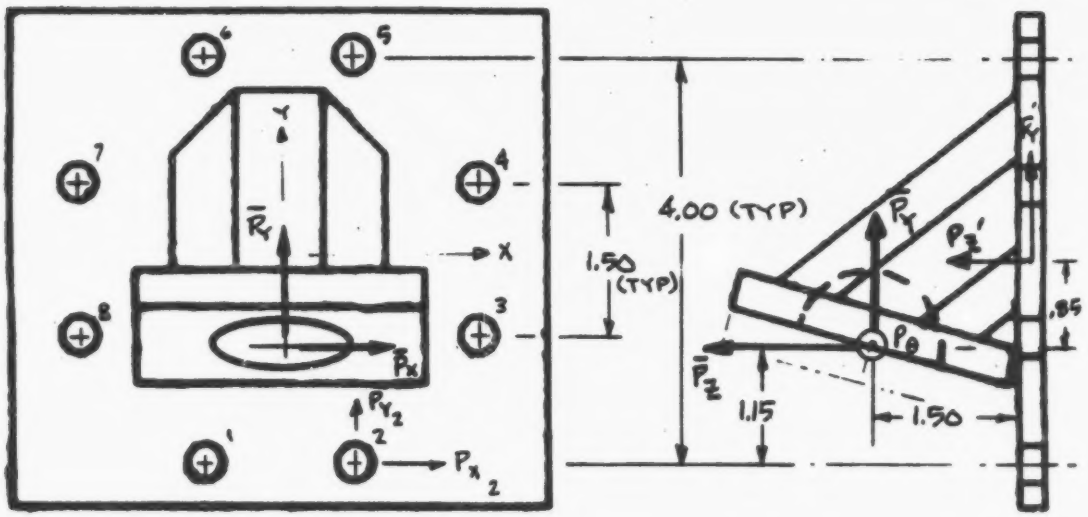


FITTING ATTACH BOLT SHEAR FORCES:

| BOLT | x | Y | $x^2$ | $Y^2$ | $P_{cx}$ | $P_{ex}$ | $P_x$ | $P_{cy}$ | $P_{ey}$ | $P_y$ | RESULTANT P |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | -.75 | -2.0 | .5625 | 4.0 | 353.4 | +294.6 | 648.0 | 584.1 | -110.5 | 473.6 | 802.6 |
| 2 | .75 | -2.0 | .5625 | 4.0 | | +294.6 | 648.0 | | +110.5 | 694.6 | 949.9 |
| 3 | 2.0 | -.75 | 4.0 | .5625 | | +110.5 | 463.9 | | +294.6 | 878.7 | 993.6 ⇦ |
| 4 | 2.0 | .75 | 4.0 | .5625 | | -110.5 | 242.9 | | +294.6 | 878.7 | 911.7 |
| 5 | .75 | 2.0 | .5625 | 4.0 | | -294.6 | 58.8 | | +110.5 | 694.6 | 697.1 |
| 6 | -.75 | 2.0 | .5625 | 4.0 | | -294.6 | 58.8 | | -110.5 | 473.6 | 477.2 |
| 7 | -2.0 | .75 | 4.0 | .5625 | | -110.5 | 242.9 | | -294.6 | 289.5 | 377.9 |
| 8 | -2.0 | -.75 | 4.0 | .5625 | 353.4 | +110.5 | 463.9 | 584.1 | -294.6 | 289.5 | 546.8 |
| Σ | | | 18.25 | 18.25 | | | 2827.2 | | | 4672.8 | |

REF BAY 1/6, REGULAR LANDING: $P_x' = 2827.3$ lb, $P_y' = 4672.8$ lb, $M = 2403.2$ in.lb } FORCES AT BOLT PATTERN CG.

LARGEST SHEAR FORCE ON FAST'R # 3 = 993.6 lb (LIM)

5.1 AEROBRAKE ATTACH FITTING ANALYSIS (CONT'D)
– AEROBRAKE ; ATTACH FASTENER ANALYSIS

TENSION LOADS :

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$$P_t = \frac{\bar{P}_z}{8} + \frac{M_x(Y)}{\Sigma x^2 + \Sigma y^2} + \frac{M_x(x)}{\Sigma x^2 + \Sigma y^2}$$

| | LIFTOFF | | | LANDING ABORT | | | REGULAR LANDING | | |
|---|---|---|---|---|---|---|---|---|---|
| BAY | $\bar{P}_z$ | $M_x$ | $M_y$ | $\bar{P}_z$ | $M_x$ | $M_y$ | $\bar{P}_z$ | $M_x$ | $M_y$ |
| 1/6 | -934.0 | -5508.9 | -1486.7 | -665.3 | 4828.4 | 3663.0 | -610.9 | 7009.2 | 4241.0 |
| 1/2 | -3018.6 | 7234.2 | -2060.9 | 683.8 | -1811.0 | 679.2 | 1945.0 | -1934.4 | 762.2 |
| 3/4 | -35.2 | 7657.7 | 4377.6 | -566.2 | -1722.3 | 69.3 | -460.9 | -3096.3 | -719.6 |
| 4/5 | 1945.1 | -5616.3 | 1927.2 | -2610.8 | 4617.6 | -929.4 | -284.1 | 7782.5 | -1408.2 |

$M_x = \bar{P}_y (1.50)$ $\quad M_y = \bar{P}_x (1.50)$

$$P_t = \frac{\bar{P}_z}{8} + \frac{M_x(Y)}{36.5} + \frac{M_y(x)}{36.5}$$

LIFTOFF, BAY 1/2:

$$P_t = -\frac{3018.6}{8} + \frac{7234.2(-2)}{36.5} + \frac{(-2060.9)(.75)}{36.5} = -816.1 \text{ lb}$$

ASSUMING LOADS CAN BE REVERSIBLE, $P_t = 816.1$ lb (LIM-TENS)

CONSERVATIVELY ASSUME MAX SHEAR CALCULATED EARLIER AND MAX TENSION FORCES ACT ON SAME FASTENER.

5.1 AEROBRAKE ATTACH FITTING ANALYSIS (CONT'D)
ATTACH FASTENERS - AEROBRAKE SIDE (CONT'D)

ASSUME $\frac{1}{4}$" DIA 95 KSI SHEAR, 160 KSI TENSION FASTR

$$P_{tu} = (160)\left(\frac{\pi D^2}{4}\right) = 7.854 \text{ KIP}$$

$$P_{su} = (95)\left(\frac{\pi D^2}{4}\right) = 4.663 \text{ KIP}$$

$$R_t = \frac{2.0(816.1)}{7854} = .2078$$

$$R_s = \frac{2.0(993.6)}{4663} = 0.4262$$

SHEAR-TENSION INTERACTION:

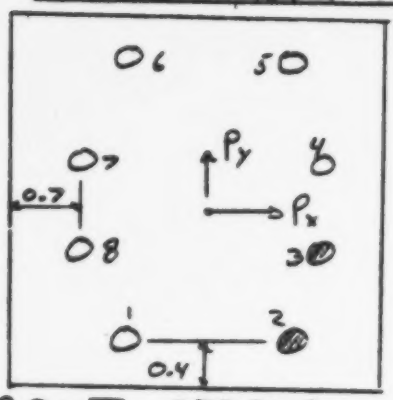
$$k^3 R_s^3 + k^2 R_t^2 = 1$$

$$k^3(.0774) + k^2(.0432) = 1$$

$$\Rightarrow k = 2.17$$

$$MS_{\text{TENS.-SHEAR}} = K - 1 = \underline{+ 1.17}$$

5.1 AEROBRAKE ATTACH FITTING STRESS ANALYSIS (CONT'D)




$t = 0.25$

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TEAROUT STRESS

largest $P_x$ (per hole) = 464 lb for holes 3, 4, 7, 8
" $P_y$ ( " " ) = 695 lb " " 1, 2, 5, 6

$F_{su} = 37$ ksi for plate $A_s = 2t(e - \frac{d}{2})$

Y- direction

$e/D = 0.4/0.375 = 1.07$ (used $e = 1.5$ in table)

$f_s = P/A_s = \frac{695 \text{ lb}}{2(.25)(0.4 - .1875)} = 6.54$ ksi

$MS_u = \frac{37}{2.0(6.54)} - 1 = \underline{\underline{+1.8}}$

X- direction

$e/D = 0.7/.375 = 1.87$ (used $e/D = 1.5$)

$f_s = P/A_s = \frac{464}{2(.25)(0.7 - .1875)} = 1.81$ ksi

$MS_u = \frac{37}{2.0(1.81)} - 1 = \underline{\underline{+9.2}}$

TOM 3/10/88

5.1.24

AFE CARRIER VEHICLE
STRESS ANALYSIS

AFE

## BEARING STRESS

max Presultant = 994 lb @ hole 3

$$f_b = P/A_b = \frac{994}{(.375)(.25)} = 10.6 \text{ ksi}$$

$F_{bru} = 99$ ksi
$F_{bry} = 83$ ksi
} $e/D = 1.5$

$$MS_u = \frac{99}{2.0(10.6)} - 1 = \underline{+3.7}$$

$$MS_y = \frac{83}{1.25(10.6)} - 1 = \underline{+5.3}$$

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|---|---|---|---|
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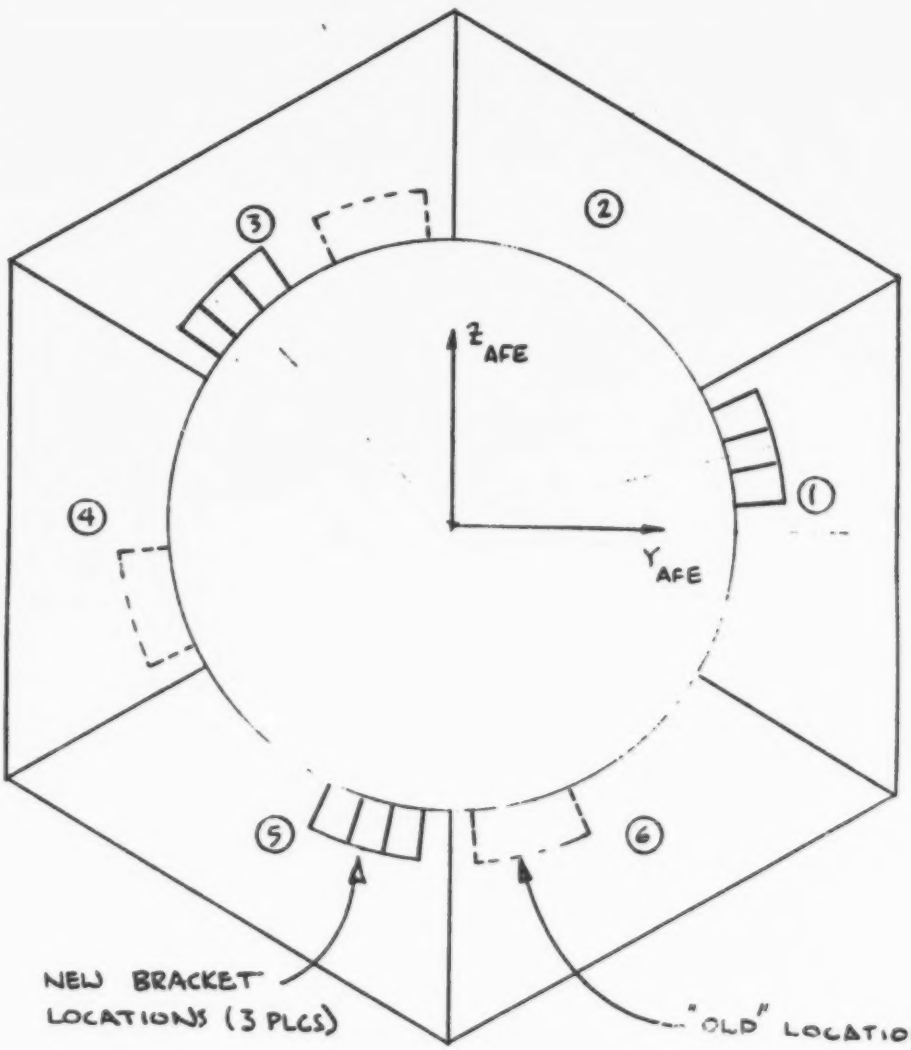
| Approved by: | Date: | | Report No. |

## 5.2 SOLID ROCKET MOTOR (SRM) ATTACH BRACKETS

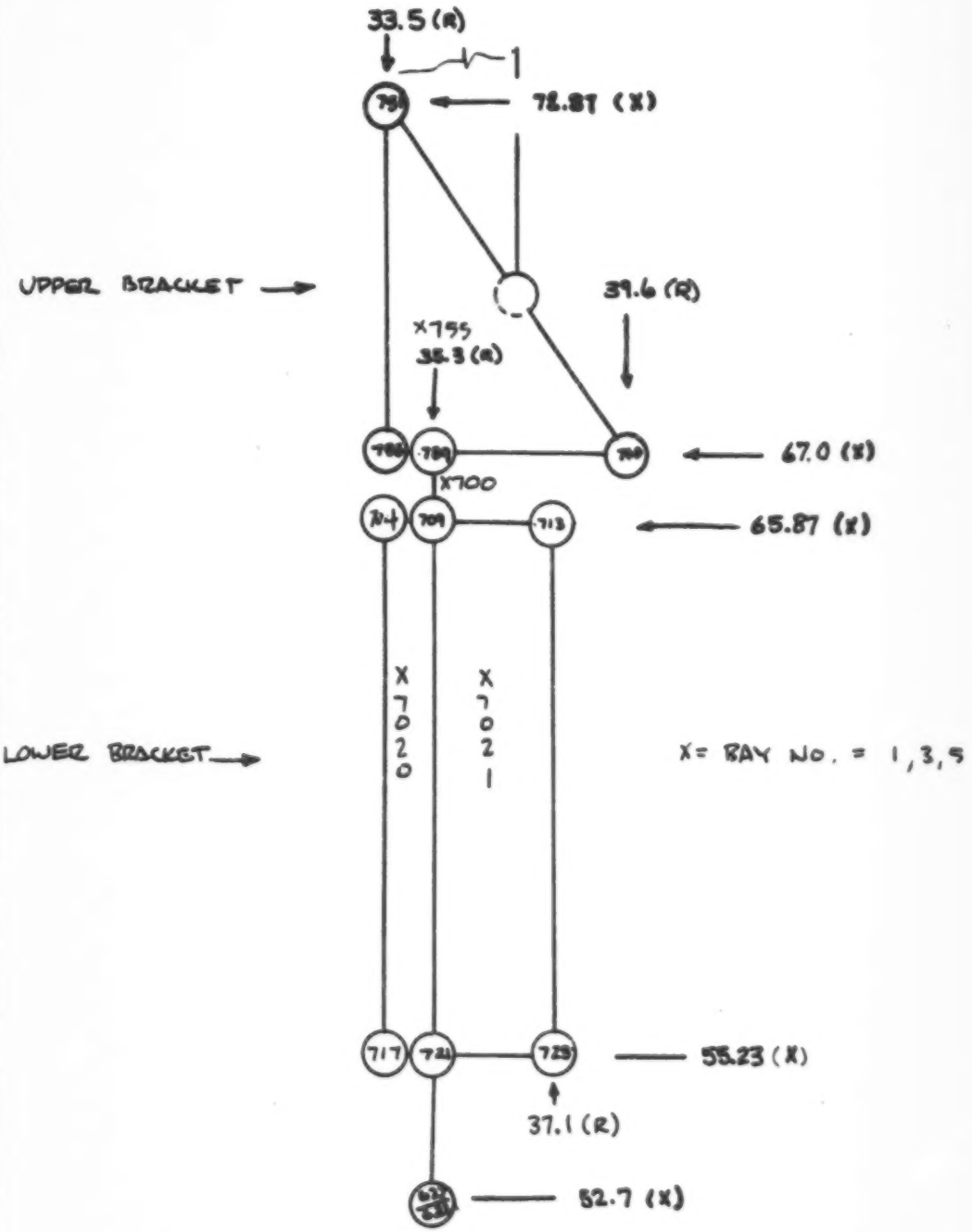



(X) ⇒ BAY NO.

- PLAN VIEW OF CARRIER VEHICLE SHOWING NEW LOCATION OF SRM SUPPORT BRACKETS

FORM LMSC 363 83

## 5.2 SRM ATTACH BRACKETS (CONT'D)




SRM SUPPORT BRACKETS NASTRAN DETAILS
- SIDE VIEW

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|---|---|---|---|
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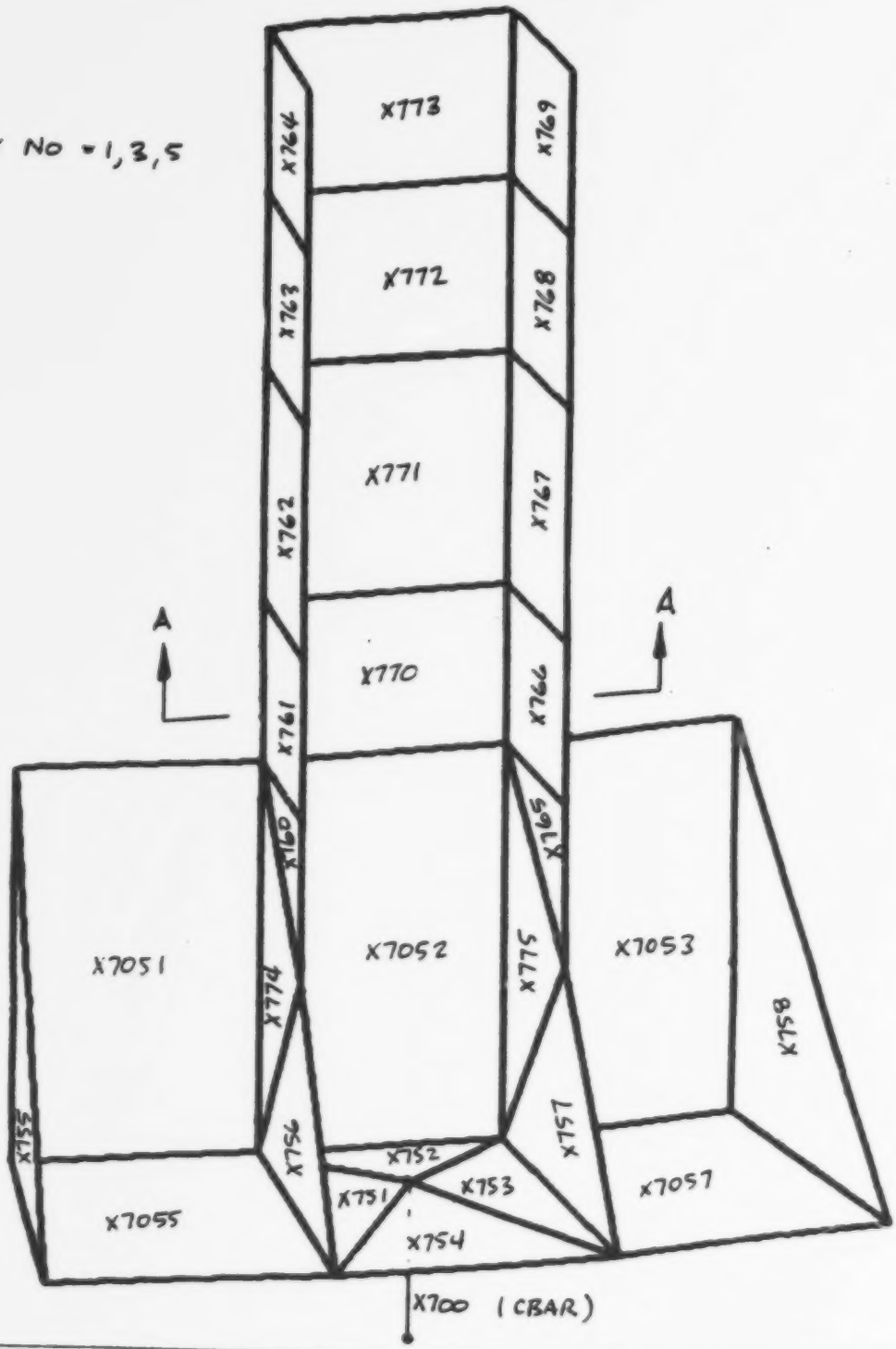
| Approved by: | Date: | | Report No. |

## 5.2 SRM ATTACH BRACKETS (CONT'D)
## - UPPER BRACKET NASTRAN DETAILS

X = BAY NO = 1, 3, 5



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|---|---|---|---|
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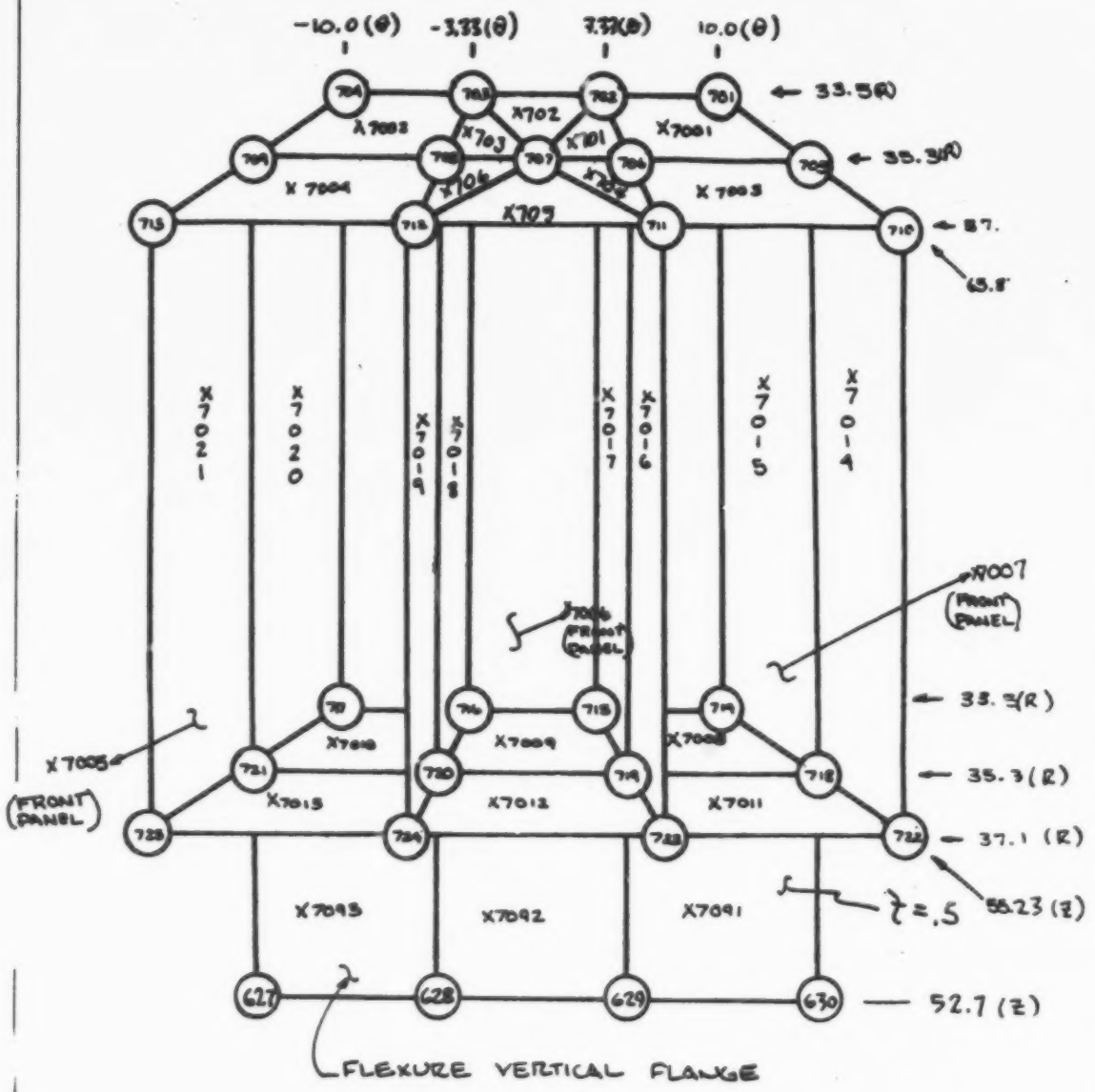
| Approved by: | Date | | Report No. |

## 5.2 SRM ATTACH BRACKETS (CONT'D)




X = BAY NO. = 1, 3, 5

SRM LOWER SUPPORT BRACKET NASTRAN DETAILS
- FRONT VIEW

FORM LMSC 362 B 3

## 5.2 SRM ATTACH BRACKETS (CONT'D)

a. LIFTOFF

| Bay No. | Element | Shear (lb) | Bending (in-lb) | Axial (lb) |
|---|---|---|---|---|
| 1 | 1700 | -11,647 | 7,988 | -5,894 |
| 3 | 3700 | 4,802 | -2,702 | -15,239 * |
| 5 | 5700 | 7,731 | -4,582 | 18,286 |

$\Sigma$ = 8,847

b. LANDING ABORT

| Bay No. | Element | Shear (lb) | Bending (in-lb) | Axial (lb) |
|---|---|---|---|---|
| 1 | 1700 | 5,129 | -3,513 | -2,689 |
| 3 | 3700 | -580 | 302 | 937 |
| 5 | 5700 | -3,951 | 2,327 | -11,962 |

$\Sigma$ = 13,714

c. THRUSTER LOADS WITH SRM ATTACHED

| Bay No. | Element | Shear (lb) | Bending (in-lb) | Axial (lb) |
|---|---|---|---|---|
| 1 | 1700 | 28 | -19 | -0.7 |
| 3 | 3700 | 30 | -18 | -1.0 |
| 5 | 5700 | 36 | -22 | 2.4 |

UPPER/LOWER BRACKET ATTACH BOLT LOADS

* worst combination

FORM LMSC 367 B 3

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5.2 SRM ATTACH BRACKETS (CONT'D)

- UPPER BRACKET ELEMENT STRESSES

| ELEMENT (2) | | LIMIT STRESS (1) (KSI) BAY 1 (X=1) | BAY 2 (X=2) | BAY 3 (X=3) |
|---|---|---|---|---|
| X751 | | -34.530 | -64.086 | 60.634 |
| X752 | | 20.919 | -82.170 | 60.475 |
| X753 | | 21.885 | -63.998 | -32.096 |
| X754 | | -29.059 | -9.364 | -4.739 |
| X755 | | -1.655 | 6.943 | -4.663 |
| X756 | CTRIA | -7.107 | 5.350 | 4.968 |
| X757 | | -6.324 | -5.505 | 4.295 |
| X758 | | 1.661 | 7.710 | -5.314 |
| X760 | | -11.339 | -4.085 | 7.418 |
| X765 | | -7.607 | -2.715 | 3.124 |
| X774 | | -2.360 | -9.121 | 6.039 |
| X775 | | -3.357 | -10.586 | 6.370 |
| X7051 | | 4.646 | 4.565 | -4.504 |
| X7052 | | 6.252 | -11.046 | 7.862 |
| X7053 | | -1.315 | -5.161 | 2.576 |
| X7055 | | 6.432 | -7.476 | 5.675 |
| X7057 | | -5.355 | -7.173 | -5.860 |
| X761 | | -5.471 | -3.194 | 4.742 |
| X762 | | -6.877 | -3.173 | 6.457 |
| X763 | | -3.732 | -2.940 | 4.083 |
| X764 | CQUAD | -1.897 | -2.229 | 2.337 |
| X766 | | -4.025 | -3.594 | 3.793 |
| X767 | | -2.191 | 1.262 | -1.680 |
| X768 | | 1.499 | .534 | .860 |
| X769 | | .718 | -.439 | .601 |
| X770 | | 17.203 | -12.538 | -12.732 |
| X771 | | 5.077 | -5.223 | -1.792 |
| X772 | | 2.608 | -4.482 | 2.469 |
| X773 | | 2.099 | -3.617 | 3.049 |

(1) MAX PRINCIPAL STRESS

(2) REF. PG. 5.2.3

(3) THESE STRESSES ARE NOT CONSIDERED REALISTIC AS THEY ARE LOCAL EFFECT OF MOMENT TRANSFERRED FROM BAR X700. WILL BE REFINED.

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5.2 SRM ATTACH BRACKETS (CONT'D)

LOWER BRACKET ELEMENT STRESSES (LIFTOFF CONDITION)

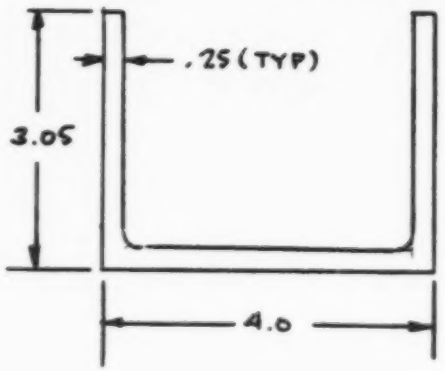
| ELEMENT ⚠ | LIMIT STRESS ⚠ (KSI) | |
|---|---|---|
| | BAY 1 (X=1) | BAY 5 (X=5) |
| X701 | -21.359 | 24.223 |
| X702 | -23.478 | 29.855 |
| X703 | 15.758 | -14.043 |
| X704 | -20.195 | 22.040 |
| X705 | 19.042 | -20.184 |
| X706 | 15.886 | -14.317 |
| X7001 | 13.663 | -13.520 |
| X7002 | 11.851 | -10.809 |
| X7003 | 12.539 | -11.447 |
| X7004 | -13.469 | 11.968 |
| X7005 | 6.127 | 4.908 |
| X7006 | -8.367 | 7.863 |
| X7007 | -8.720 | 8.410 |
| X7008 | -9.550 | 9.053 |
| X7009 | -10.322 | 9.054 |
| X7010 | -7.598 | 7.967 |
| X7011 | 13.158 | -14.085 |
| X7012 | -9.865 | -12.322 |
| X7013 | -12.662 | 8.663 |
| X7014 | -6.602 | 6.463 |
| X7015 | -9.737 | 8.939 |
| X7016 | -3.813 | 5.984 |
| X7017 | -5.708 | 8.791 |
| X7018 | 10.423 | 3.807 |
| X7019 | -17.530 | 3.970 |
| X7020 | 7.480 | -6.053 |
| X7021 | 3.763 | -3.061 |
| X7091 | -16.606 | 29.709 |
| X7092 | 10.807 | -10.397 |
| X7093 | 25.227 | -9.131 |

⚠ MAX PRINCIPAL STRESS ⚠ REF. FIG. 5

FORM LMSC 382 B 3

5.2 SRM ATTACH BRACKETS (CONT'D)

- UPPER BRACKET STRESS ANALYSIS




SECT A-A

ALLOWABLE FLANGE CRIPPLING STRESS:
(REF NACA TN 3782 FOR METHOD)

$$b_w = 4 - 2\left(\frac{.25}{2}\right) = 3.75$$

$$b_f = 3.05 - \frac{.25}{2} = 2.925$$

$$\frac{b_f}{b_w} = \frac{2.925}{3.750} = .78$$

$\Rightarrow k_w = 1.45$ (REF PG. 5.2.9)

$$F_c = \frac{k_w \pi^2 E}{12(1-\nu^2)} \cdot \frac{t_w^2}{b_w^2} = \frac{(1.45)(\pi^2)(10.8\times10^6)(.25)^2}{12(1-.33^2)(3.75)^2}$$

$F_c = 64.2$ KSI $> F_{cy} = 51.0$ KSI $\therefore$ USE $F_{cy}$

$f_c = 17.2$ KSI (REF TABLE , ELEMENT 1770)

$$MS_{\text{COMPRESSION-YIELD}} = \frac{51.0}{1.1(17.2)} - 1 = \underline{+1.69\ (Y)}$$

$$MS_{\text{CRIPPLING-ULT}} = \frac{51.0}{2.0(17.2)} - 1 = \underline{+.48\ (U)}$$

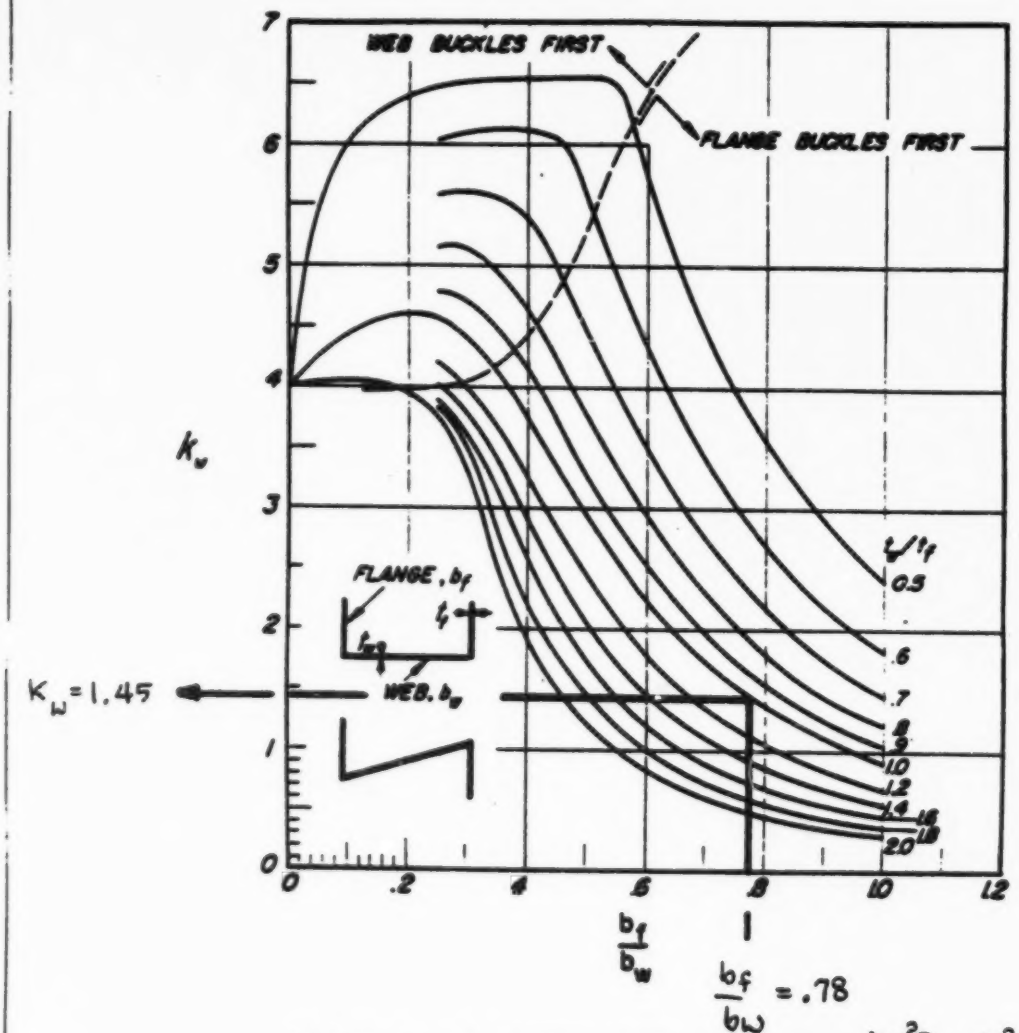
FORM LMSC 382 8-3

5.2 SRM ATTACH BRACKETS (CONT'D)

- UPPER BRACKET STRESS ANALYSIS (CONT'D)

NACA TN 3782, FIG. 5:






(a) Channel- and Z-section stiffeners. $\sigma_{cr} = \frac{k_v \pi^2 E}{12(1 - \nu_e^2)} \frac{t_w^2}{b_w^2}$.

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|---|---|---|---|
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## 5.2 SRM SUPPORT BRACKET STRESS ANALYSIS

THE STRESSES SUMMARIZED IN THE PREVIOUS TABLES REPRESENT THE MAX PRINCIPAL STRESS THAT RESULTS FROM THE COMBINATION OF AXIAL, BENDING AND SHEAR LOADS ON THE ELEMENT.

THE MOST CRITICAL (HIGHLY STRESSED ELEMENT IS CTRIA2 NO. 5702 WHICH IS AT THE TOP END OF THE LOWER BRACKET, ADJACENT TO THE ATTACH BOLT. THIS STRESS RESULTS PRIMARILY FROM BENDING; THEREFORE A SIMPLE COMPARISON TO $F_{ty}$, $F_{tu}$ WILL BE THE FAILURE CRITERIA.

$$f_b = 29.895 \text{ KSI (LIMIT)}$$

$$MS_{YIELD} = \frac{51.0}{(1.25)(29.895)} - 1 = \underline{\underline{+.36}}$$

$$MS_{ULT} = \frac{63.0}{(2.0)(29.895)} - 1 = \underline{\underline{+.05}}$$

FORM LMSC 362 B 3

## 5.2 SRM ATTACH BRACKETS (CONT'D) - EFFECT ON CENTER CYLINDER

CYLINDER PANEL ELEMENT STRESSES (LIFTOFF)

| Element | Limit Stress (ksi) Bay 3 |
|---|---|
| X 01 | 3.01 |
| X 02 | 4.62 |
| X 03 | 5.49 |
| X 04 | 6.90 |
| X 05 | 8.73 |
| X 06 | 6.34 |
| X 07 | 5.02 |
| X 08 | 7.92 |
| X 09 | -7.57 |
| X 10 | 2.44 |
| X 11 | -3.26 |
| X 12 | -3.04 |
| X 13 | 3.44 |
| X 14 | -4.06 |
| X 15 | -5.65 |
| X 16 | -7.80 |
| X 17 | -9.07 |
| X 18 | -7.72 |
| X 19 | 2.29 |
| X 20 | -2.55 |
| X 21 | 2.53 |
| X 22 | 5.21 |
| X 23 | -7.05 |
| X 24 | -8.24 |
| X 25 | -9.96 |
| X 26 | -11.24 |
| X 27 | -10.44 |
| X 28 | 2.23 |
| X 29 | 2.77 |
| X 30 | 3.17 |

X=300

FORM LMSC 3278-1

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## 5.2 SEM ATTACH BRACKETS (CONT'D)

CYLINDER PANEL ELEMENT STRESSES (LIFTOFF) (CONT'D)

| Element | Limit Stress (ksi) Bay 3 |
|---|---|
| X31 | 6.25 |
| X32 | 4.73 |
| X33 | -14.07 |
| X34 | -19.14 |
| X35 | -19.88 |
| X36 | -13.91 |
| X37 | 2.22 |
| X38 | -2.59 |
| X39 | 3.82 |
| X40 | 5.77 |
| X41 | -8.50 |
| X42 | -10.17 |
| X43 | -9.22 |
| X44 | -9.57 |
| X45 | -8.52 |
| X46 | 2.85 |
| X48 | -2.35 |
| X50 | 2.65 |
| X51 | -7.43 |
| X52 | -10.99 |
| X53 | -8.15 |
| X54 | -4.43 |
| X58 | 3.62 |
| X59 | -2.93 |
| X60 | -4.66 |
| X61 | -3.29 |
| X62 | -2.54 |
| X63 | 3.84 |

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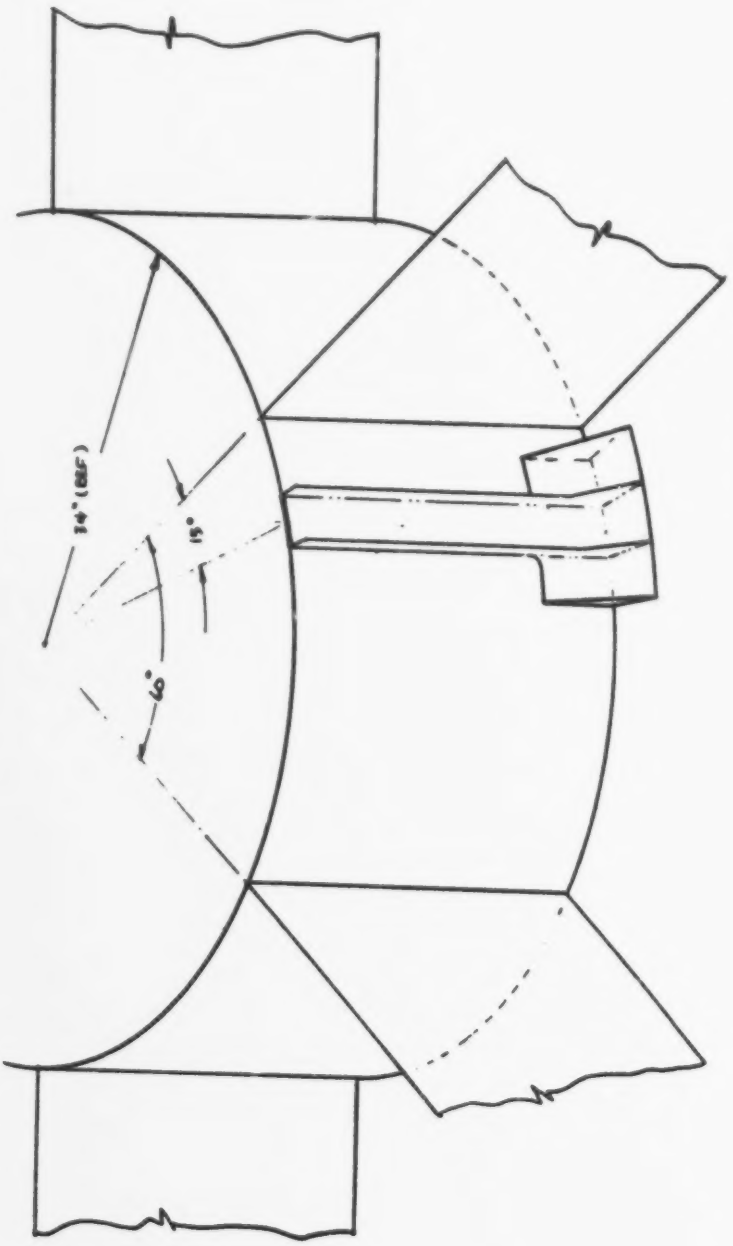
5.2 SRM ATTACH BRACKET

- MODIFIED UPPER BRACKET (FULL HEIGHT)




NUMBER OF BRACKETS = 3, SPACED AT 120° INTERVALS.

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|---|---|---|---|
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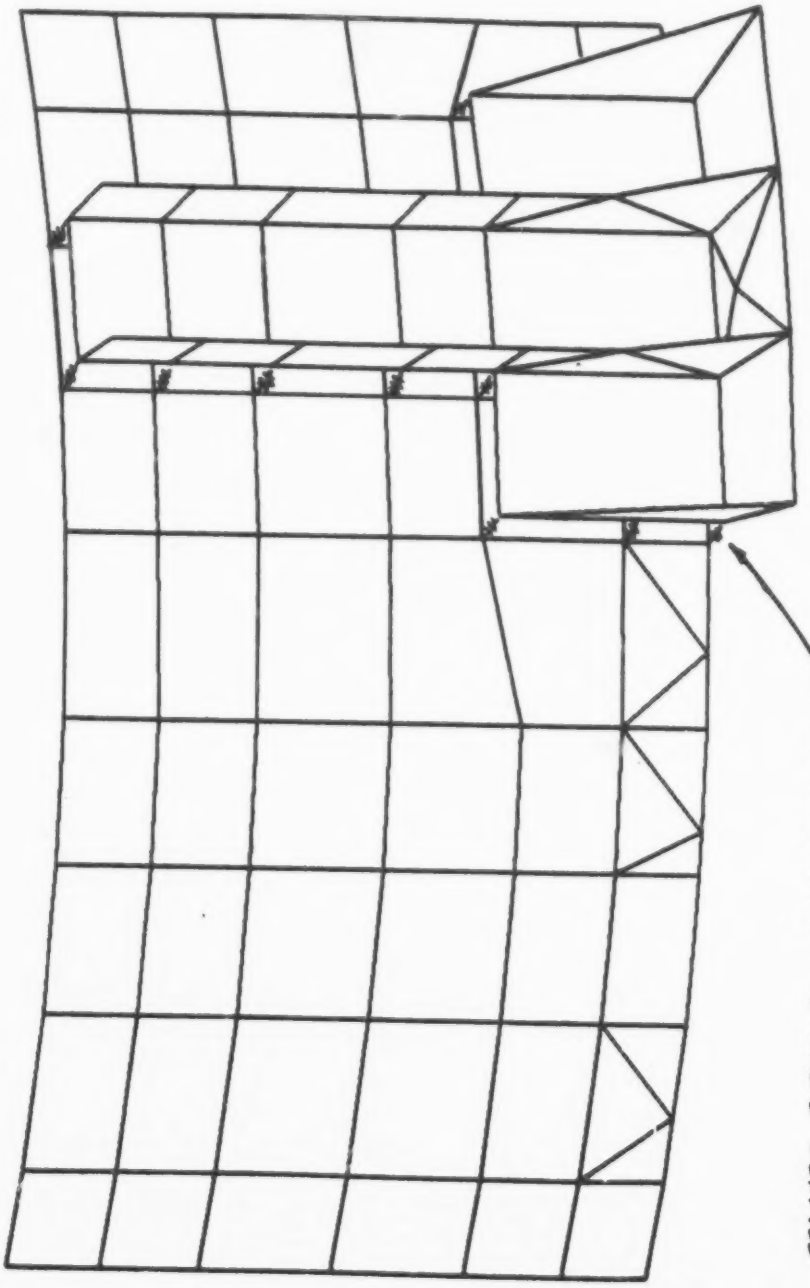
5.2 SRM ATTACH BRACKET

- NASTRAN MODEL PLOT OF BRACKET / CYLINDER SEGMENT



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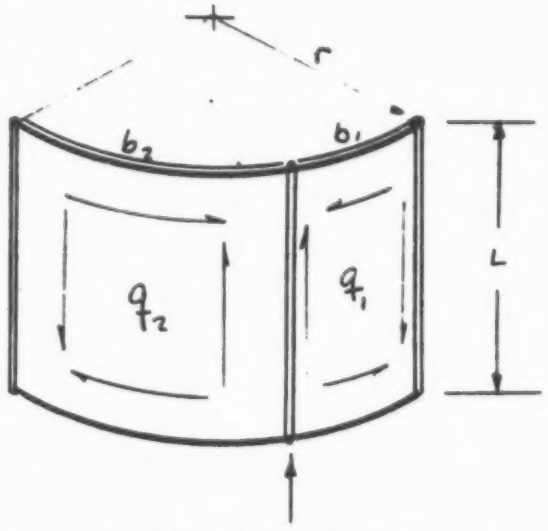
| | | | |

5.2 SRM SUPPORT BRACKET (CONT'D)

CURVED PANEL (CYLINDER SEGMENT) BUCKLING ALLOWABLE

MATERIAL: 2219-T87
.125" THK

$b_1 = 8.90"$
$b_2 = 26.70"$
$L = 20.0"$




REF. NACA TN 3783, FIG 49: (INCLUDED ON PG. ) FOR ANALYSIS METHOD.

PANEL 1: ("LONG" PANEL)

$$Z_b = \frac{b^2}{rt}(1-\nu^2)^{1/2} = \frac{(8.9)^2}{(34)(.125)}(1-.33^2)^{1/2}$$

$$Z_b = 17.6$$

$$\frac{a}{b} = \frac{L}{b} = \frac{20}{8.9} = 2.25$$

$$\Rightarrow K_s = 20$$

$$\uparrow_{cr_1} = \frac{K_s \pi^2 E}{12(1-\nu^2)}\left(\frac{t}{b}\right)^2 = \frac{(20)\pi^2(10.5\times10^6)}{12(1-.33^2)}\left(\frac{.125}{8.9}\right)^2$$

$$\Rightarrow \uparrow_{cr_1} = 38,234 \text{ psi}$$

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5.2 SRM SUPPORT BRACKET (CONT'D)

- CURVED PANEL (CYLINDER SEGMENT) BUCKLING ALLOWABLES

PANEL 2: ($b_2 > L$ $\Rightarrow$ "WIDE" PANEL)

$$Z_b = \frac{b^2}{rt}(1-\nu^2)^{1/2} = \frac{(26.7)^2}{(34)(.125)}(1-.33^2)^{1/2}$$

$$Z_b = 158.3$$

$$\frac{a}{b} = \frac{b_2}{L} = \frac{26.7}{20.} = 1.34$$

$$\Rightarrow K_s = 41.0$$

$$\tau_{cr_2} = \frac{K_s \pi^2 E}{12(1-\nu^2)}\left(\frac{t}{b}\right)^2 = \frac{41(\pi^2)(10.5\times10^6)}{12(1-.33^2)}\left(\frac{.125}{26.7}\right)^2$$

$$\Rightarrow \tau_{cr_2} = 8{,}709 \text{ psi}$$

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5.2 SRM SUPPORT BRACKETS (CONT'D)

- CURVED PANEL (CYLINDER) BUCKLING ALLOWABLES

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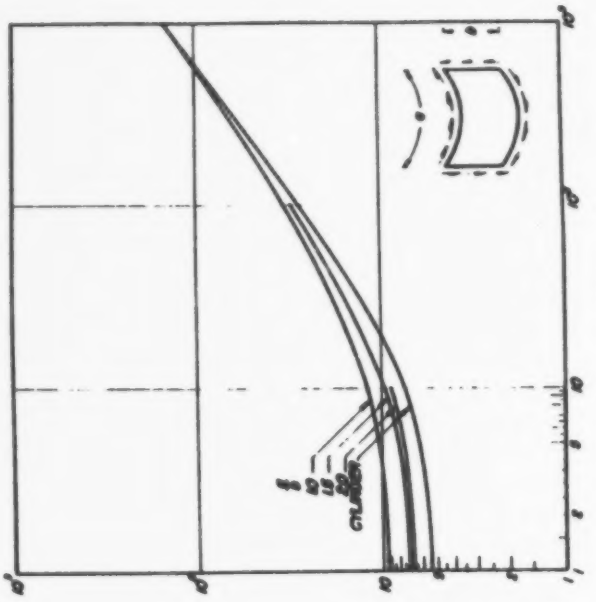
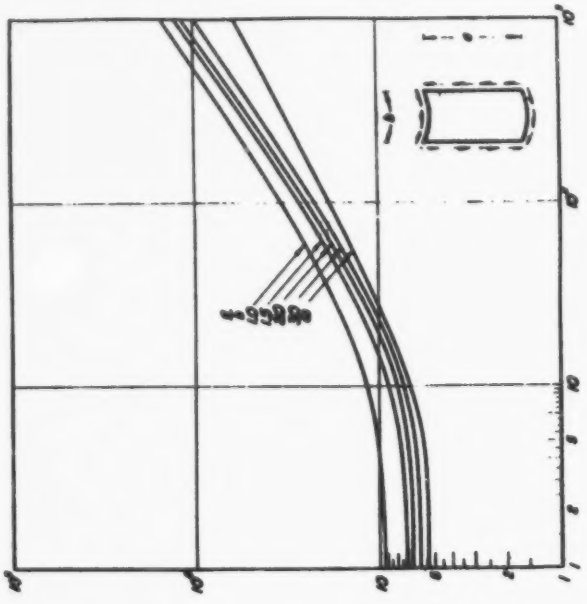
SHEAR BUCKLING CURVES FROM NACA 3783, FIG. 44:




(c) Wide, simply supported plates.

Figure 9.- Continued




(a) Long simply supported plates.

Figure 9.- Shear buckling coefficients for various curved plates.

$$\tau_{cr} = \frac{k_s \pi^2 E}{12\left(1-\nu_e^2\right)}\left(\frac{t}{b}\right)^2 ; \quad Z_b = \frac{b^2}{rt}\left(1-\nu_e^2\right)^{1/2}$$

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5.2 SRM ATTACH ANALYSIS (CONT'D)

- CYLINDER PRINCIPAL SHEAR STRESSES

BAY: 1 LOAD CONDITION: LANDING ABORT

$\tau_{MAX}$ IN NASTRAN ELEMENTS FOR 60° SEGMENT OF CYLINDER:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 749 | 898 | 727 | 803 | 1328 | 1936 | 1348 | 655 | 912 |
| 436 | 238 | 259 | 379 | 605 | 1061 | 1138 | 524 | 1102 |
| 266 | 185 | 335 | 359 | 686 | 269 | 1119 | 1343 | 1416 |
| 311 | 187 | 198 | 567 | 952 | 1162 | 2217 | 3147 | 2366 |
| 263 | 295 | 440 | 654 | 1359 | 871 | 902 | 1144 | 2380 |
| 674 | 819 | 1142 | 1240 | 1318 | 539 | 625 | 1364 | 2783 |

1217 1627 1925 1752 1918 958

UPR PANEL

LWR PANEL

RADIAL BEAM INTERSECT

RADIAL BEAM INTERSECT

PANEL SHEAR BUCKLING MARGINS:
(CONSERVATIVELY ASSUME MAX SHEAR EXISTS THROUGHOUT PANEL:

PANEL 1: $\tau_{MAX} = 3{,}147$ psi (LIMIT)

$$MS_{SHEAR\text{-}BUCKLING} = \frac{38.2}{(2.0)(3.15)} - 1 = \underline{\underline{HIGH}}$$

PANEL 2: $\tau_{MAX} = 1925$ psi

$$MS_{SHEAR\text{-}BUCKLING} = \frac{8.7}{2(1.93)} - 1 = \underline{\underline{+1.25}}$$

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5.2 SRM ATTACH ANALYSIS (CONT'D)

- CYLINDER PRINCIPAL SHEAR STRESSES

BAY: 3 LOAD CONDITION: LANDING ABORT

↑ MAX IN NASTRAN ELEMENTS FOR 60° SEGMENT OF CYLINDER:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 474 | 507 | 559 | 592 | 558 | 774 | 869 | 395 | 334 |
| 330 | 356 | 353 | 244 | 294 | 537 | 628 | 354 | 263 |
| 310 | 260 | 308 | 236 | 388 | 696 | 528 | 781 | 324 |
| 291 | 245 | 276 | 305 | 201 | 1140 | 1637 | 1291 | 550 |
| 239 | 240 | 288 | 380 | 204 | 313 | 296 | 291 | 516 |
| 192 | 236 / 253 / 418 | 355 | 252 / 521 | 420 | 598 | 282 | 649 | 838 |

496

UPR PANEL

LWR PANEL

BY COMPARISON TO BAY 1, ALL SHEAR - BUCKLING MARGINS ARE HIGH.

RADIAL BEAM INTERSECT

RADIAL BEAM INTERSECT

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5.2 SRM ATTACH ANALYSIS (CONT'D)

- CYLINDER PRINCIPAL SHEAR STRESSES

BAY: 5 LOAD CONDITION: LANDING ABORT

$\tau_{MAX}$ IN NASTRAN ELEMENTS FOR 60° SEGMENT OF CYLINDER:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2031 | 2135 | 2831 | 2242 | 1747 | 4245 | 2905 | 2451 | 2887 |
| 1742 | 1879 | 2002 | 2530 | 2070 | 4003 | 3686 | 2447 | 2850 |
| 1633 | 1688 | 1627 | 2183 | 4001 | 4193 | 3730 | 3010 | 3715 |
| 1606 | 1570 | 1551 | 2126 | 4272 | * 6702 | 6501 | 3798 | 4039 |
| 1647 | 1498 | 1447 | 1900 | 3450 | 2678 | 2458 | 1256 | 2405 |
| 1465 | 1406 / 1363 / 1671 | 1293 | 1350 / 2825 / 1491 | 3140 | 2014 | 2272 | 955 | 2273 |

UPR PANEL

LWR PANEL

* THE 6,702 psi SHEAR STRESS SEEMS TO BE A LOCAL RESULT DUE TO ITS LOCATION AT THE CORNER OF THE FITTING. THEREFORE IT WILL NOT BE USED FOR BUCKLING CALCULATIONS.

RADIAL BEAM INTERSECT

PANEL 1: $\tau_{MAX} = 4039$ psi

$$MS_{\text{SHEAR BUCKLING}} = \frac{38.2}{(2.0)(4.04)} - 1 = \underline{\underline{+4.73}}$$

PANEL 2: $\tau_{MAX} = 4,272$ psi

$$MS_{\text{SHEAR-BUCKLING}} = \frac{8.7}{(2.0)(4.27)} - 1 = \underline{\underline{+.02}}$$

RADIAL BEAM INTERSECT

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5.2 SRM ATTACH ANALYSIS (CONT'D)

- CYLINDER PRINCIPAL SHEAR STRESSES

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BAY: 1 LOAD CONDITION: LIFTOFF

$\tau_{MAX}$ IN NASTRAN ELEMENTS FOR 60° SEGMENT OF CYLINDER:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1200 | 1434 | 1746 | 1997 | 1098 | 1677 | 915 | 1275 | 1307 |
| 1347 | 1533 | 1781 | 2210 | 1572 | 2325 | 2429 | 1385 | 1544 |
| 1427 | 1481 | 1534 | 1807 | 3031 | 3358 | 2631 | 1891 | 1965 |
| 1528 | 1444 | 1548 | 1654 | 3085 | 5111* | 4445 | 1592 | 2902 |
| 1547 | 1600 | 1484 | 1419 | 2245 | 1593 | 1609 | 1787 | 3855 |
| 1545 | 1727 / 2455 | 1774 | 1070 / 3155 | 1895 / 3341 / 4311 | 1212 | 1455 | 2106 | [illegible] |

1652 2279

UPR PANEL

LWR PANEL

RADIAL BEAM INTERSECT

PANEL 1: $\tau_{max} = 4445$ psi

$$MS_{SHEAR\ BUCKLING} = \frac{38.2}{2.0(4.45)} - 1 = +3.29$$

PANEL 2: $\tau_{max} = 5111$ psi

$$MS_{SHEAR\ BUCKLING} = \frac{8.7}{2.0(3.36)} - 1 = +.29$$

RADIAL BEAM INTERSECT

* LOCAL EFFECT FROM FITTING — NOT REPRESENTATIVE OF OVERALL PANEL STRESS.

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2. SRM ATTACH ANALYSIS (CONT'D)

- CYLINDER PRINCIPAL SHEAR STRESSES

BAY: 3 LOAD CONDITION: LIFTOFF

$\uparrow_{MAX}$ IN NASTRAN ELEMENTS FOR 60° SEGMENT OF CYLINDER:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2999 | 3387 | 3532 | 2476 | 2242 | 4338 | 3360 | 2594 | 3232 |
| 2179 | 2095 | 2048 | 2348 | 1867 | 3140 | 2576 | 2465 | 3304 |
| 1898 | 1901 | 2126 | 2061 | 3177 | 2640 | 2777 | 3194 | 4069 |
| 1775 | 1780 | 1747 | 2210 | 3961 | * 4938 | 5349 | 4983 | 4651 |
| 1911 | 1630 | 1474 | 2346 | 4312 | 2904 | 2450 | 1381 | 2429 |
| 1703 | 1418 / 1295 | 1402 | 2273 / 2527 | 3531 | 2145 | 2022 | 2048 | 3075 |

UPR PANEL

LWR PANEL

1757 1965

PANEL 1: $\uparrow_{max} = 5349$ psi

$$MS = \frac{38.2}{2.0(5.35)} - 1 = \underline{+2.57}$$

PANEL 2: $\uparrow_{max} = 4938$ psi

$$MS = \frac{8.7}{2.0(4.34)} - 1 = \underline{+.00}$$

RADIAL BEAM INTERSECT

RADIAL BEAM INTERSECT

* LOCAL EFFECT FROM FITTING - NOT REPRESENTATIVE OF OVERALL PANEL STRESS.

5.2 SRM ATTACH ANALYSIS (CONT'D)
- CYLINDER PRINCIPAL SHEAR STRESSES

BAY: 5 LOAD CONDITION: LIFTOFF

$\tau_{MAX}$ IN NASTRAN ELEMENTS FOR 60° SEGMENT OF CYLINDER:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2114 | 2118 | 2661 | 2536 | 2401 | 3806 | 2269 | 2383 | 2631 |
| 1935 | 2031 | 2171 | 2729 | 1867 | 3503 | 3168 | 2476 | 2550 |
| 1864 | 1873 | 1834 | 2248 | 3759 | 3872 | 3163 | 2805 | 2978 |
| 1906 | 1738 | 1837 | 2254 | 4087 | 5821 * | 4620 | 1834 | 2872 |
| 1902 | 1954 | 1699 | 2075 | 3213 | 2579 | 2081 | 1113 | 2537 |
| 2286 | 2076 / 3404 | 2279 | 1409 * / 4408 | 3350 | 1882 | 1883 | 855 | 2761 |

UPR PANEL

LWR PANEL

2301 3044

RADIAL BEAM INTERSECT

RADIAL BEAM INTERSECT

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PANEL 1: $\tau_{max} = 4620$ psi

$$MS = \frac{38.2}{2.0(4.62)} - 1 = \underline{3.1}$$

PANEL 2: $\tau_{max} = 4408$ psi

$$M.S. = \frac{8.7}{2.0(4.09)} - 1 = \underline{+.06}$$

* LOCAL EFFECTS FROM ADJACENT FITTINGS - NOT REPRESENTATIVE OF OVERALL PANEL STRESS

| Prepared by: E. INGRAM | Date 3-28-88 | LOCKHEED MISSILES & SPACE COMPANY, INC. | Page 5.3.1 |
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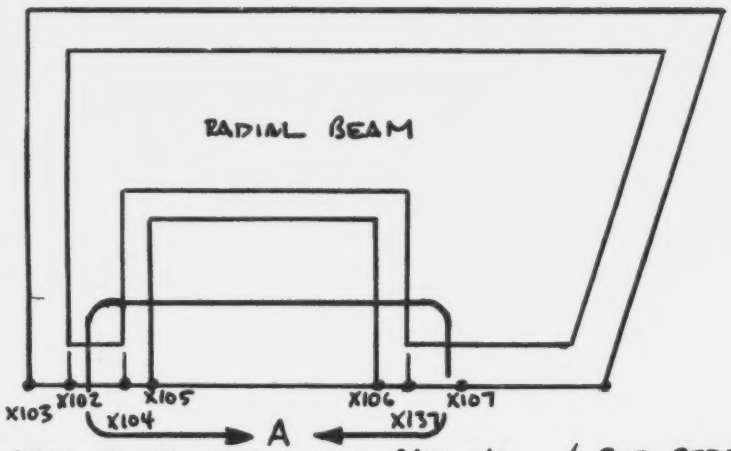
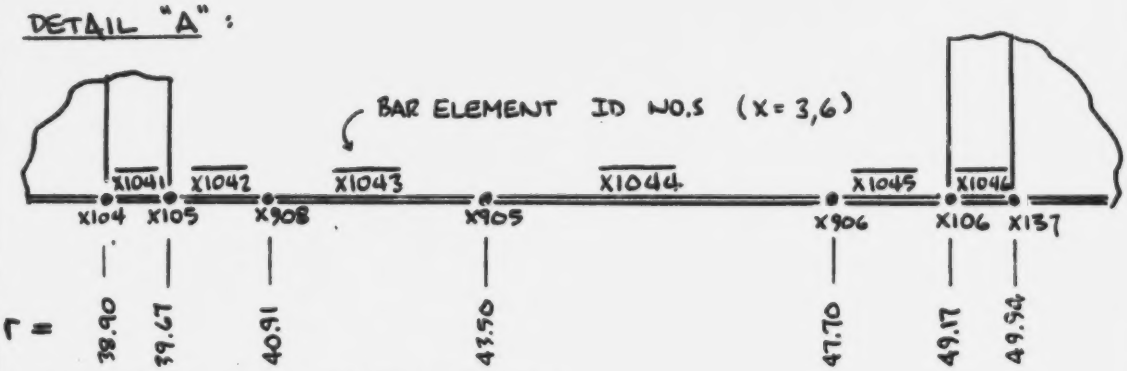
## 5.3 THRUSTER SUPPORT BEAM ANALYSIS

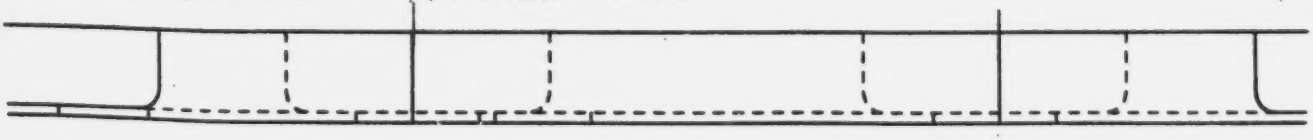



GRID POINT NO.S , X => BAY NO. ( FOR REFERENCE )
(NASTRAN) X = 3,6

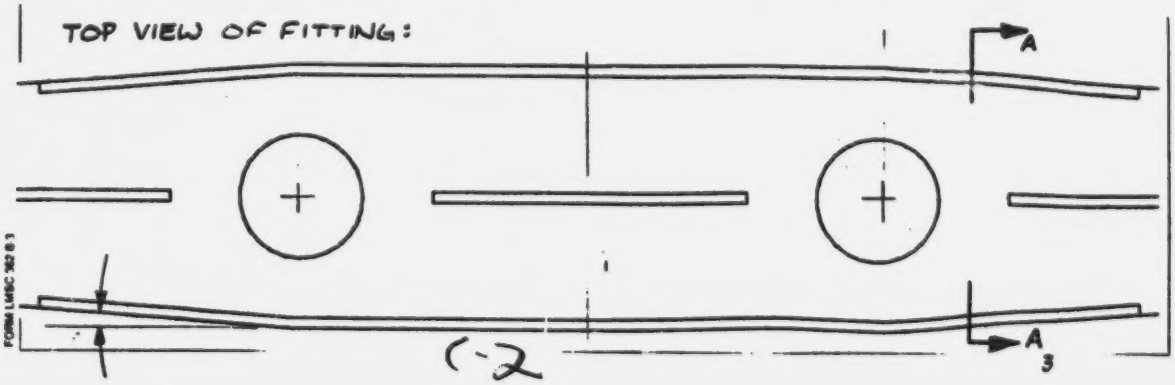
DETAIL "A":




SIDE VIEW OF THRUSTER FITTING:



TOP VIEW OF FITTING:

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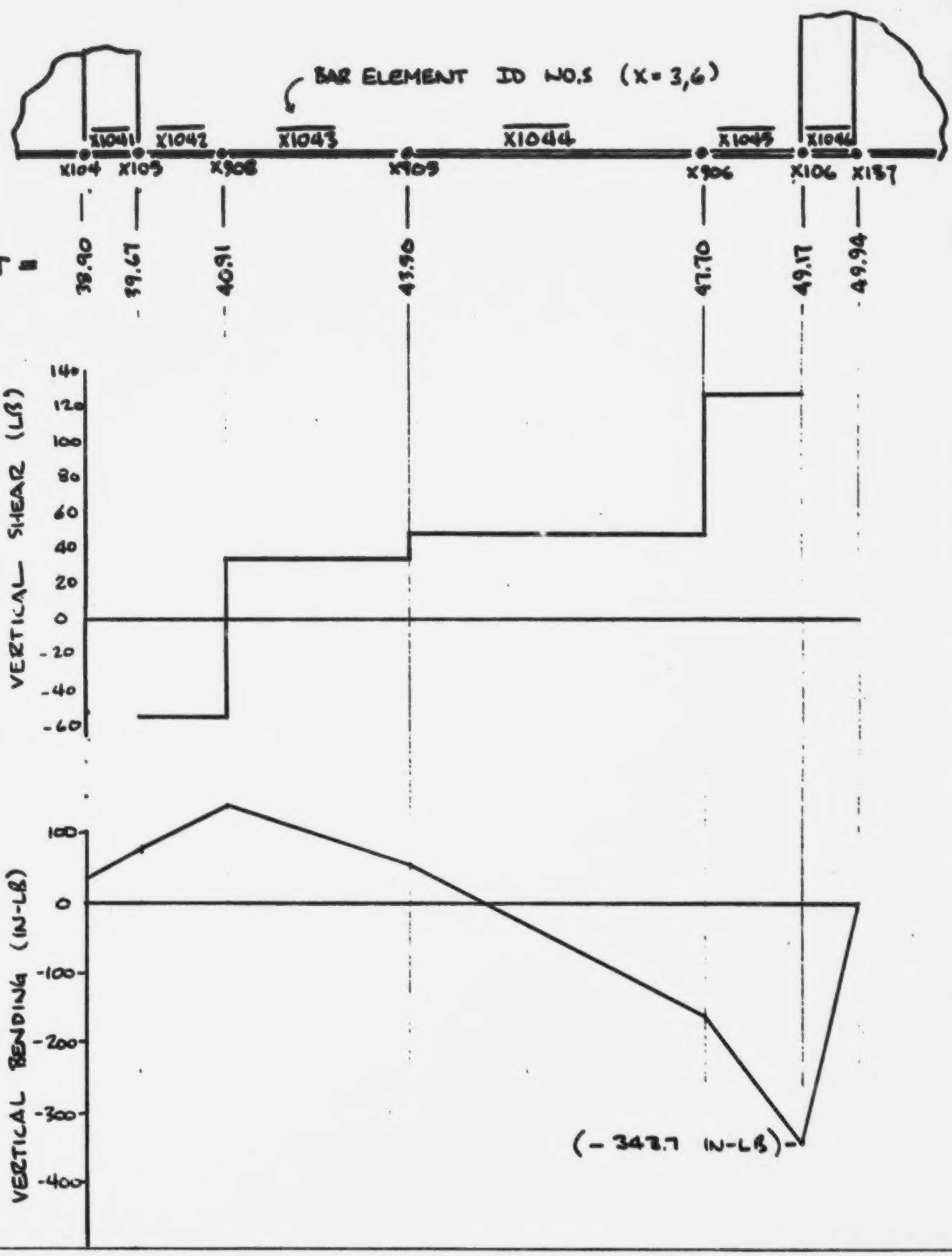
5.3 THRUSTER SUPPORT BEAM (CONT'D)

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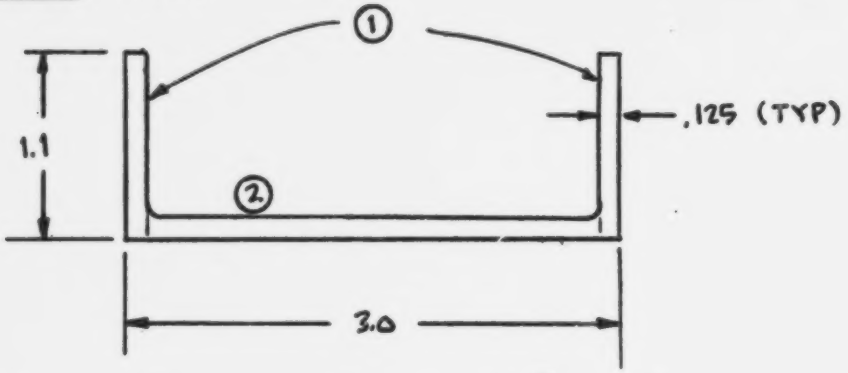
5.3 THRUSTER SUPPORT BEAM (CONT'D)

SECTION A-A (P. 1)




| ELEM | A | Y | AY | $AY^2$ | $I_o$ |
|---|---|---|---|---|---|
| 1 | .2750 | .550 | .1513 | .0832 | .0277 |
| 2 | .3281 | .0625 | .0205 | .0013 | .0004 |
| | .6031 | | .1718 | .0845 | .0281 |

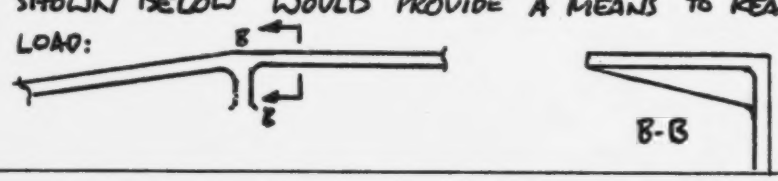
$$\bar{Y} = \frac{.1718}{.6031} = .2849 \text{ IN}$$

$$I_c = .0845 + .0281 - .6031(.2849)^2 = .0637 \text{ IN}^4$$

BENDING STRESS:

$$f_b = \frac{My}{I} = \frac{-343.7\,(1.10 - .2849)}{.0637} = -4398 \text{ psi}$$

ALTHOUGH THIS STRESS LEVEL IS QUITE LOW AND OBVIOUSLY BELOW THE (ALLOWABLE) CRIPPLING STRESS, THERE IS A SLIGHT BEND (APPROX. 4.5°) THAT WILL INTRODUCE A "KICK" LOAD ON THIS FLANGE. IN EFFECT, IT MAKES THE FLANGE BEHAVE AS IF IT WERE ALREADY CRIPPLED. A SMALL SUPPORT AS SHOWN BELOW WOULD PROVIDE A MEANS TO REACT THE KICK LOAD:

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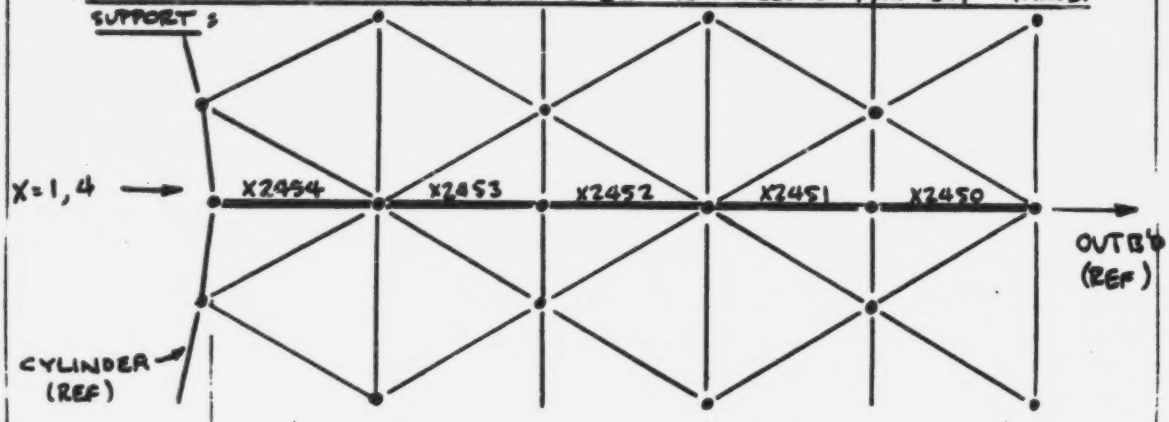
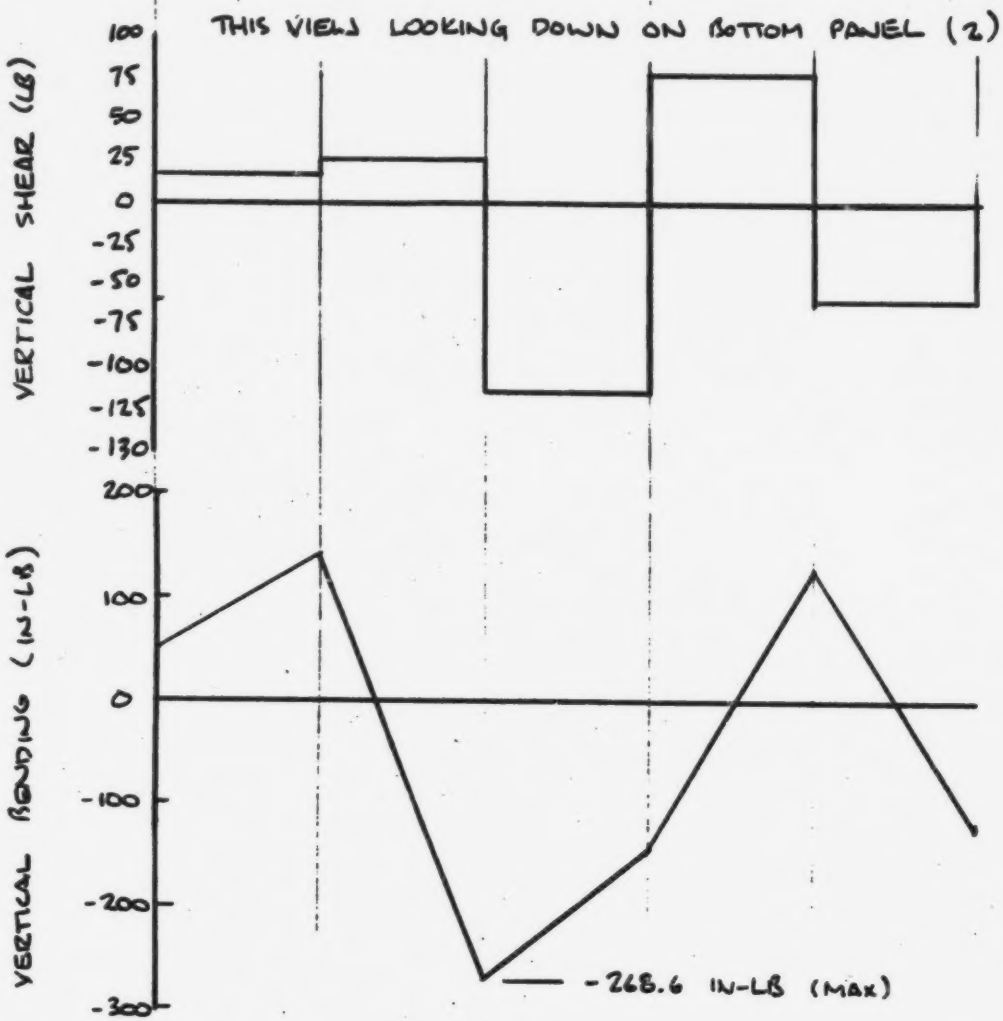
5.3 THRUSTER BEAM AT MID PANEL (BAYS 1 AND 4)

- MODIFICATION TO NASTRAN MODEL TO INCLUDE MID-BAY THRUST SUPPORTS




THIS VIEW LOOKING DOWN ON BOTTOM PANEL (2)

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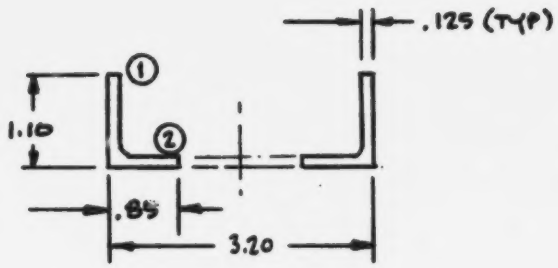
5.3 THRUSTER BEAM AT MID PANEL (BAYS 1 AND 4) (CONT'D)

MID PANEL BEAM CROSS SECTION:




| ELEM | A | Y | AY | $AY^2$ | $I_o$ |
|---|---|---|---|---|---|
| 1 | .275 | .550 | .1513 | .0832 | .0277 |
| 2 | .1813 | .0625 | .0113 | .0007 | .0002 |
| Σ | .4563 | | .1626 | .0839 | .0279 |

$$\bar{y} = \frac{.1626}{.4563} = .3563 \text{ IN}$$

$$I_c = .0839 + .0279 - .4563(.3563)^2 = .0539 \text{ IN}^4$$

BENDING STRESS: (AXIAL COMPRESSION LOADS WERE < 10 LB)

$$f_b = \frac{My}{I} = \frac{-268.6\,(1.1 - .3563)}{.0539} = -3706 \text{ psi}$$

IN ABSENCE OF CRIPPLING ALLOWABLE DATA FOR 2219-T87 ALUM., USE 2024-T3 DATA CONTAINED IN LOCKHEED STRESS MEMO NO 110

$$@\ \frac{b}{t} = \frac{(1.1 - .125)}{.125} = 7.8, \Rightarrow F_{cc} = 37.5 \text{ KSI (ONE EDGE FREE)}$$

$$MS_{\text{CRIPPLING}} = \frac{37.5}{3.7(2.0)} - 1 = \underline{+\text{HIGH}}$$

FORM LMSC 3828 3

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|---|---|---|---|
| Checked by: | Date | Title AFE CV Bottom Panel Isogrid Layout | Model AFE CV |
| Approved by: | Date | | Report No. |

5.4 TRUNNION FTG BACK-UP STRUCTURE ANALYSIS
- NASTRAN MODEL DETAILS OF LOWER PANELS SHOWING 3 TRUNNION LOCATIONS

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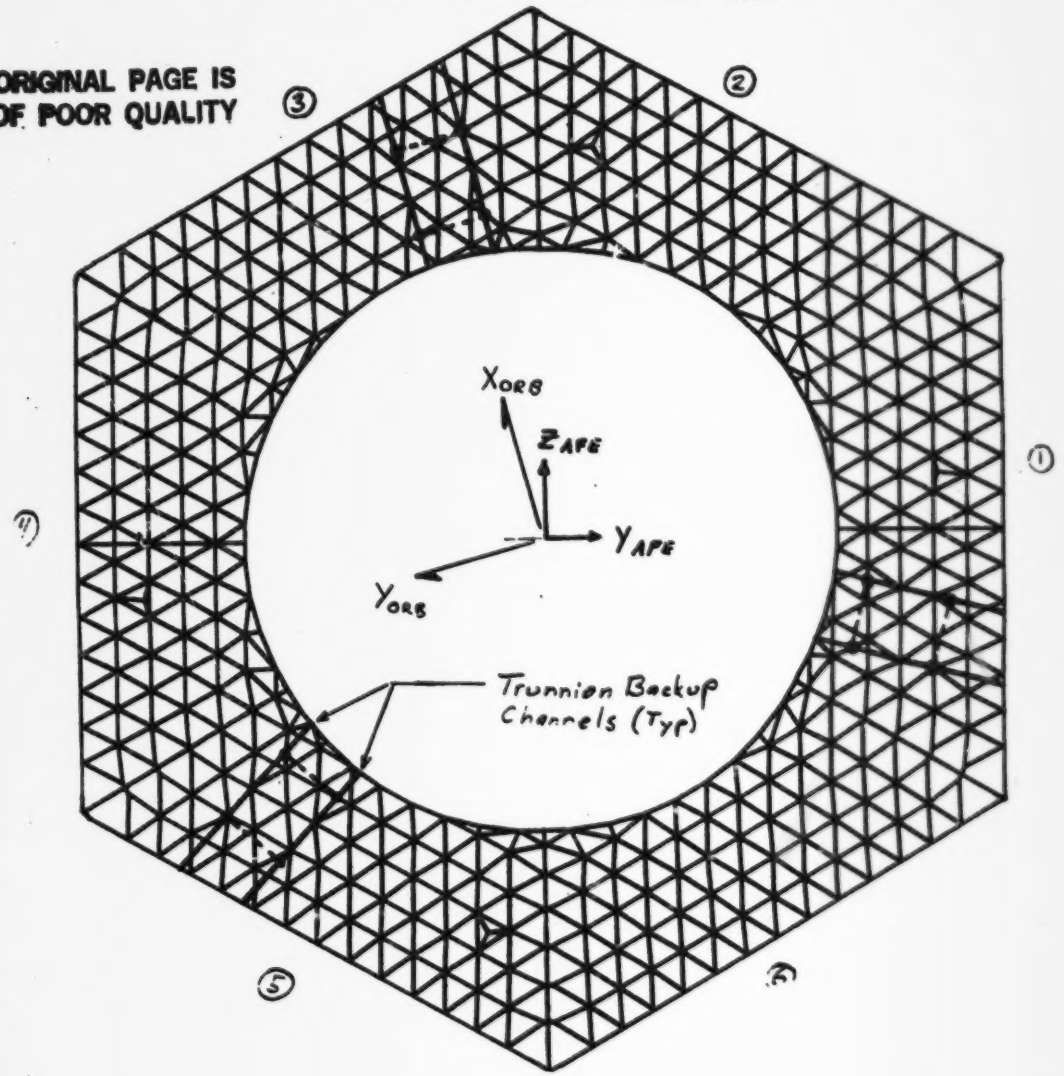


Figure 1

FORM LMSC-3283

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|---|---|---|---|
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## 5.4 TRUNNION FTG BACK UP STRUCTURE ANALYSIS

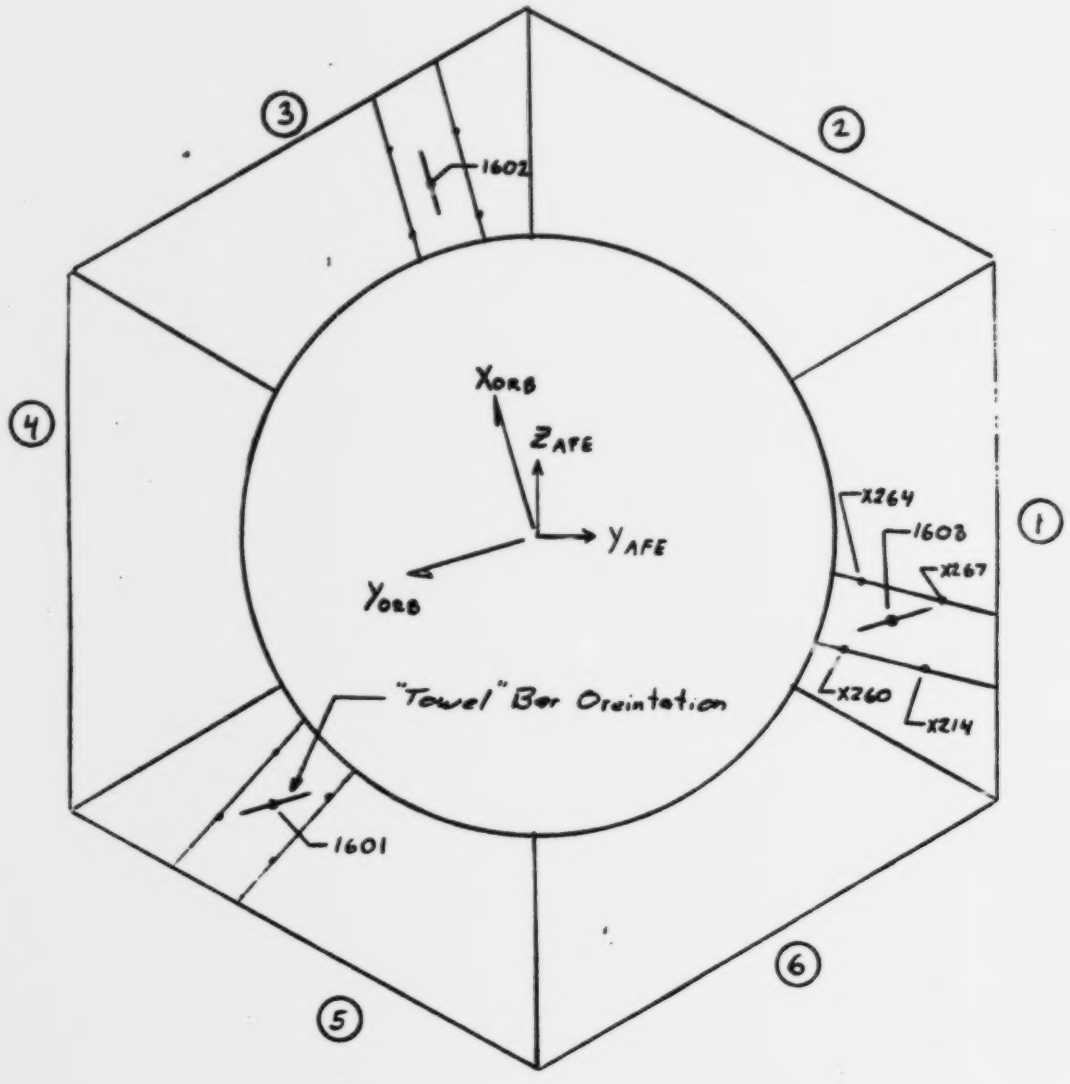


Figure 2.

FORM LMSC 3283

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|---|---|---|---|
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## 5.4 TRUNNION FTG BACK UP STRUCTURE ANALYSIS

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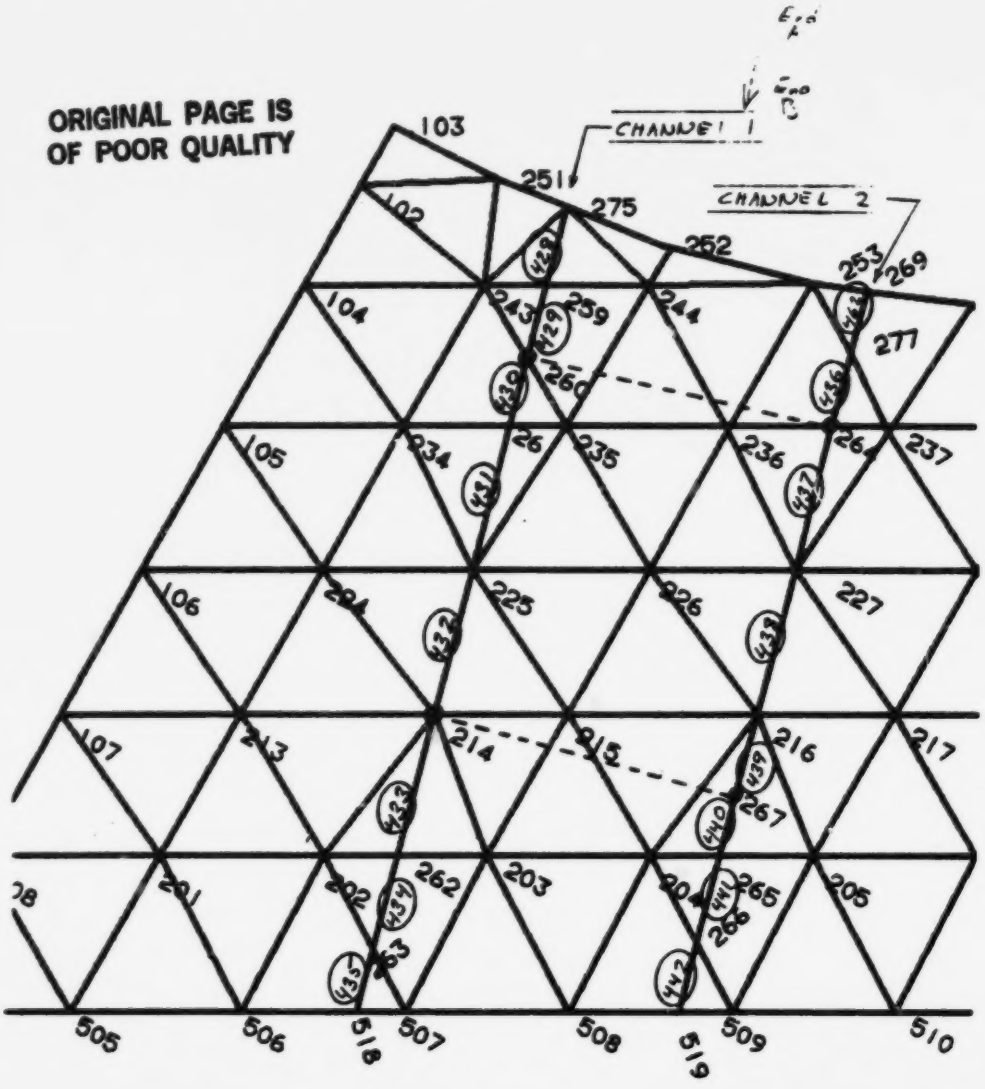


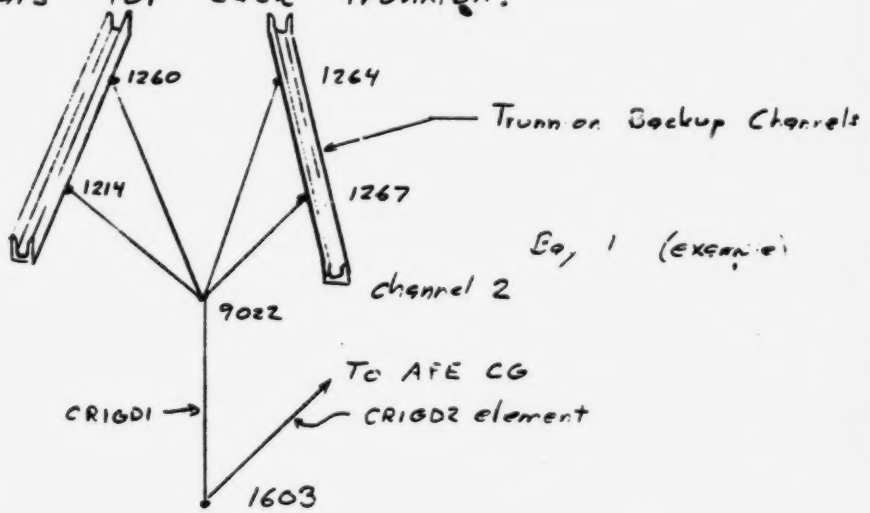

Figure 3. Enlarged Bottom Isogrid Panel Showing Trunnion Backup Structure

Node numbering: Bay No × 1,000 + number shown
Element " : Bay No × 10,000 + 2,000 + number shown

FORM LMSC 302 B 3

## 5.4 TRUNNION FTG BACK-UP STRUCTURE ANALYSIS

Figure 1 shows the trunnion backup structure on the AFE CV bottom isogrids. An outline of the trunnion footing is also shown. Figure 2 shows the orientation of the trunnion "towel" bars and the grid point ID's for the bars. Force components along the "towel" bar's axes were released for each trunnion. Bar elements were used to spread the regular landing trunnion forces to four nodes on the two "channel" bars for each trunnion.

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FORM LMSC 382 8 3

FORM LMSC 362 B-3

Prepared by: T O Murray Date 6/3/82 | Checked by: Date | Approved by: Date

LOCKHEED MISSILES & SPACE COMPANY, INC.

Title: AFE CARRIER VEHICLE STRESS ANALYSIS

Model: AFE CV Report No.

Page 5.4.5

5.4 TRUNNION FTG BACK UP STRUCTURE ANALYSIS

Table 1.

Vertical Bending Moments (M2) in Channel Elements

| | Element No. | Bay 1 Moment (k-in) End A | Bay 1 Moment (k-in) End B | Bay 3 Moment (k-in) End A | Bay 3 Moment (k-in) End B | Bay 5 Moment (k-in) End A | Bay 5 Moment (k-in) End B |
|---|---|---|---|---|---|---|---|
| Channel 1 | X 428 | 0.07 | -3.12 | 0.14 | 8.56 | 0.22 | -12.37 |
| | X 429 | -3.18 | -6.92 | 8.54 | 18.78 | -12.36 | -27.12 |
| | X 430 | -10.34 | -8.61 | 21.56 | 22.24 | -33.71 | -32.13 |
| | X 431 | -8.55 | -4.05 | 22.22 | 24.10 | -32.06 | -28.18 |
| | X 432 | -4.18 | 0.20 | 24.09 | 26.10 | -28.26 | -24.59 |
| | X 433 | -1.24 | -0.59 | 30.84 | 15.73 | -32.09 | -16.95 |
| | X 434 | -0.59 | -0.20 | 15.73 | 6.08 | -16.95 | -6.57 |
| | X 435 | -0.18 | 0.03 | 6.04 | -0.23 | -6.49 | 0.09 |
| Channel 2 | X 467 | 0.07 | -7.83 | 0.06 | -2.09 | -0.06 | -2.52 |
| | X 436 | -7.89 | -18.72 | -1.97 | -4.72 | -2.79 | -6.53 |
| | X 437 | -24.66 | -21.42 | 3.81 | -5.73 | -10.68 | -6.76 |
| | X 438 | -21.43 | -18.36 | 5.69 | -7.71 | -6.80 | -2.75 |
| | X 439 | -18.34 | -16.52 | -7.76 | -9.09 | -2.74 | -0.49 |
| | X 440 | -28.31 | -17.20 | -9.99 | -7.34 | -2.34 | -1.75 |
| | X 441 | -17.20 | -7.24 | 7.33 | -3.07 | -1.76 | -0.81 |
| | X 442 | -7.16 | 0.32 | 3.04 | 0.11 | -0.80 | -0.11 |

X = 12, 32, 52 (Bays 1, 3, 5)

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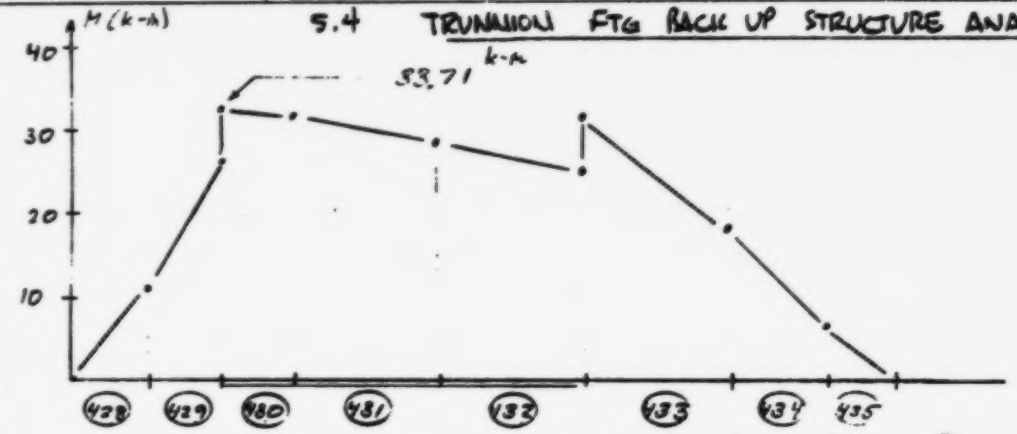
## 5.4 TRUNNION FTG BACK UP STRUCTURE ANALYSIS




Bay 5, Vertical Bending Moment Diagram
Channel 1

The vertical bending moments are multiple factors above the lateral moments. Because the channel section properties are similar for both principle directions, element no. 430 will be considered critical. The related forces for this element are as follows:

$M_2$ = 33.71 k-in (shown)
$M_1$ = 5.15 k-in } from NASTRAN
$P$ = 3.84 k } output

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FORM LMSC 382 8-3

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|---|---|---|---|
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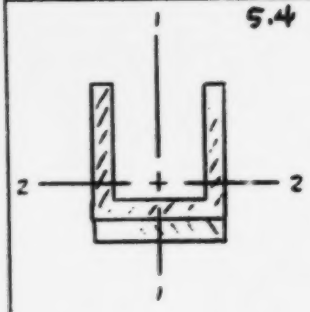
5.4 TRUNNION PTG PACK UP STRUCTURE ANALYSIS




Section properties:

$A = 2.375\ in^2$

$I_2 = 1.157\ in^4$

$I_1 = 1.175\ in^4$

$C_2 = 1.0$

$C_1 = 1.665$

$$f_{Total} = \frac{P}{A} + \frac{M_1 C_2}{I_1} + \frac{M_2 C_1}{I_2}$$

Max loads (from page 5.4.6)

$M_2 = 33.71$ k-in

$M_1 = 5.15$ k-in

$P = 3.84$ k

$$f_{Total} = \frac{3.84\,k}{2.375\,in^2} + \frac{5.15(1.0)}{1.175} + \frac{33.71(1.665)}{1.157}$$

$$= 54.51\ ksi$$

$$MS_{yield} = \frac{51.0}{1.25(54.51)} - 1 = \underline{\underline{-0.25}}$$

$$MS_{ult} = \frac{63.0}{2.0(54.51)} - 1 = \underline{\underline{-0.42}}$$

The vertical bending moment is lower from the previous analysis but the section is still inadequate.

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FORM LMSC 382 B 3

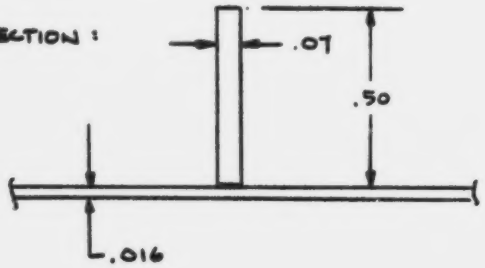
## 5.5 UPPER AND LOWER ISOGRID PANELS

Each isogrid bar in the upper and lower panels is represented by a CBAR element and thus is able to produce individual bar forces (axial, shear, moment and torque) for subsequent stress analysis. During the course of evaluating several hundred isogrid bars per panel for twelve panels and five load conditions and repeating the process for each design/model update, the need for a way to post process the NASTRAN output for the analysis of the isogrid bars has become apparent.

A FORTRAN program has been written and is now in use which reads the NASTRAN ouput and searches for the isogrid bars, identifying them by their property ID. The program then distinguishes between upper and lower panel elements and uses pre-determined allowables to calculate and print the isogrid bar margins of safety. The following pages include the calculation of the allowables that are currently being used in this program. The upper panel allowables are based simply on the bar critical (instability) axial and bending loads. The buckling load for these bar elements is based upon an end fixity factor of 2.0 as recommended by the McDonnel-Douglas Isogrid Design Handbook. The lower panel isogrid allowables are based on using the buckling load of the thin triangular panel (determined by NACA 3781) and treating the bar in the same way as an integral stiffener. The output from this " ISOGRD" program is included in this section following the calculation of allowables.

## 5.5 UPPER AND LOWER PANEL SKIN BUCKLING ALLOWABLES

ISOGRID CROSS-SECTION:

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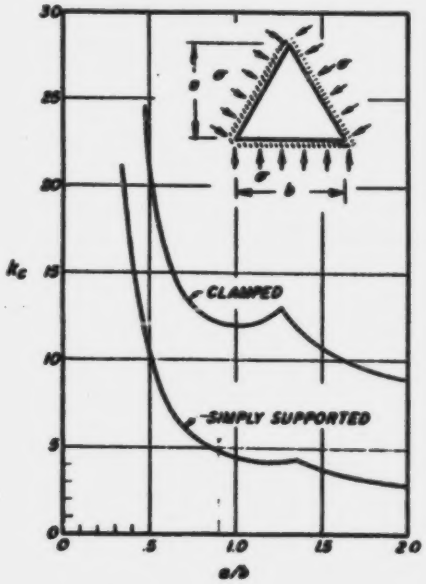
I. BUCKLING OF TRIANGULAR PLATE (REF. NACA TN 3781)

$$\sigma_{cr} = \frac{k\pi^2 E}{12(1-\nu^2)}\left(\frac{t}{b}\right)^2$$

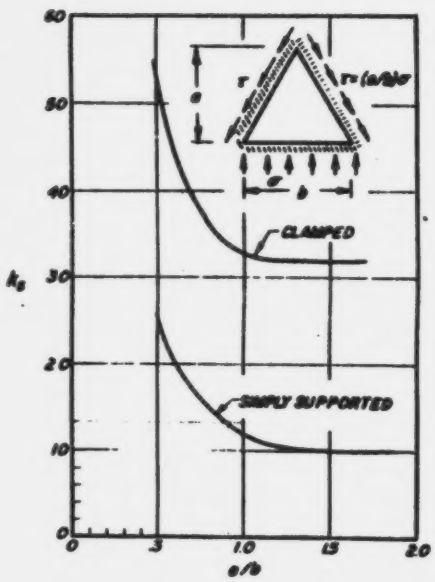
@ $\frac{a}{b} = .866$ (EQUIL. TRIANGLE), $k_c = 5.0$, $k_s = 13$

UNIFORM COMPRESSION $\rightarrow$ $\sigma_{cr} = \frac{(5.)(\pi^2)(10.7\times10^6)}{12(1-.33^2)}\left(\frac{.016}{4.2}\right)^2 = 689.8$ psi

COMPRESSION BALANCED BY EDGE SHEAR $\rightarrow$ $\sigma_{cr} = \frac{(13.5)(\pi^2)(10.3\times10^6)}{12(1-.33^2)}\left(\frac{.016}{4.2}\right)^2 = 1,862.5$ psi




(a) Uniform compression.




(b) Shear

Figure 34.- Buckling coefficients for isosceles triangular plates.

FORM LMSC 302 8-3

## 5.5 UPPER AND LOWER PANEL BUCKLING ALLOWABLES (CONT'D)

CRIPPLING ALLOWABLE OF UPSTANDING LEG OF ISOGRID. FIRST ANALYZE ASSUMING THE (BUCKLED) SKIN PROVIDES LATERAL TRANSLATIONAL SUPPORT BUT NOT ROTATIONAL. IE, SIMPLE SUPPORTS.

REF SM NO 80 c. (Δ): (USE 2024-T81 PROPERTIES BY SIMILARITY)

Δ, TABLE II → $K_s = 1.095$, $n = 25$, $F_{.7} = 55.0$ KSI

$$\frac{b}{t} = \frac{.50}{.07} = 7.143$$

Δ, FIG 8 → $B_{cc} = 1.02$ (ONE EDGE FREE)

$$B = K_s B_{cc} = 1.095\,(1.02) = 1.1169$$

FIG 1 → $F/F_{.7} = .78$

$$F_{cr} = .78\,(55.) = 42.9 \text{ KSI}$$

TOTAL →
$$F_{c_T} = \frac{F_{c_{SKIN}}(A_{SKIN}) + F_{c_{STIFF.}}(A_{STIFF})}{A_{TOT}}$$

$$F_{c_T} = \frac{.690\,(4.2)(.016) + 42.9\,(.50)(.07)}{(4.2)(.016) + (.50)(.07)}$$

$$F_{c_T} = 15.15 \text{ KSI}$$

THIS IS THE ALLOWABLE STRESS TO BE USED WHEN THE THIN SKIN IS INCLUDED IN THE NASTRAN STIFFNESS MATRIX. IT ACCOUNTS FOR THE FACT THAT THE SKIN WILL BUCKLE EARLY.

STIFFENER (CBAR) AXIAL FORCE:

⇨ $P_a = 15{,}150\,(.07)(.50) = 530$ LB

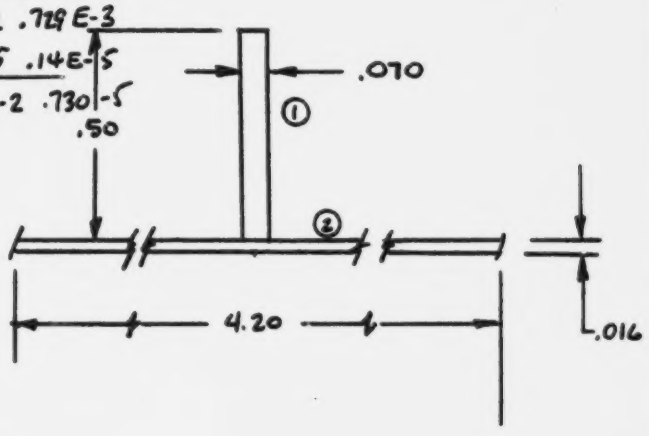
FORM LMSC 352 8 3

| Prepared by: INGRAM | Date 4-27-88 | LOCKHEED MISSILES & SPACE COMPANY, INC. | Page 5.5.4 |
|---|---|---|---|
| Checked by: | Date | Title: AFE CARRIER VEHICLE ISOGRID PANEL ANALYSIS | Model: AFE |
| Approved by: | Date | | Report No. |

## 5.5 UPPER AND LOWER ISOGRID PANELS (CONT'D)

## PURE BENDING ALLOWABLE OF ISOGRID CROSSECTION

| i | A | Y | AY | $AY^2$ | $I_o$ |
|---|---|---|---|---|---|
| ① | .035 | .266 | .931E-2 | .247E-2 | .729E-3 |
| ② | .067 | .008 | .536E-3 | .430E-5 | .14E-5 |
| Σ | .102 | | .985E-2 | .2474E-2 | .730E-5 |




$$\bar{Y} = \frac{\Sigma AY}{\Sigma A} = .0966$$

$$I_c = \Sigma AY^2 + \Sigma I_o - \Sigma A(\bar{Y})^2$$

$$I_c = 1.530 \times 10^{-3}$$

APPLY UNIT MOMENT

$$f_{b_u} = \frac{M(Y')}{I} = \frac{-1(.50+.016-.0966)}{1.530 \times 10^{-3}} = -274.1 \text{ psi}$$

$$f_{b_l} = \frac{M(\bar{Y})}{I} = \frac{-1(-.0966)}{1.53 \times 10^{-3}} = 63.1 \text{ psi}$$

DETERMINE MAGNITUDE OF BENDING MOMENT WHEN $f_{b_u}$ IS EQUAL TO CRIPPLING STRESS OF VERTICAL FLANGE.

$$\Rightarrow M_a = 1\left(\frac{42{,}900}{274.1}\right) = 156.6 \text{ IN-LB}$$

COMPRESSION / BENDING INTERACTION (REF SM NO 70 a, TABLE I)

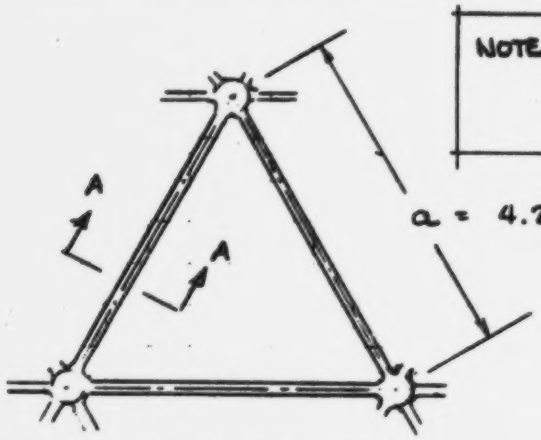
$$\Rightarrow R_b^{1.75} + R_c = 1 \quad ; \quad R_b = \frac{m}{M_a} \; , \quad R_c = \frac{P}{P_a}$$

FORM LSSC 282 8-3

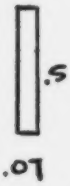
## 5.5 UPPER AND LOWER ISOGRID PANELS (CONT'D)

### ISOGRID LOCAL "BAR" ALLOWABLES ~ UPPER PANEL (NO SKIN)

NOTE: PER MSFC-HDBK-505A
STABILITY ⇒ MEAN DIMENSIONS
TENSION ⇒ MIN. DIMENSIONS




### I. COMPRESSION ALLOWABLE ~ ELASTIC COLUMN BUCKLING

A-A: 


$$I_{MIN} = \frac{bh^3}{12} = 14.3 \times 10^{-6} \text{ IN}^4$$

$$P_{COL} = C\pi^2\frac{EI}{a^2} = \frac{2.0^{*}\pi^2(10.3\times10^{6})(14.3\times10^{-6})}{(4.2)^2}$$

$$P_{COL} = 164.8 \text{ lb}$$

$$F_{COL} = \frac{164.8}{(.07)(.5)} = 4.709 \text{ KSI (ULT)(ELASTIC)}$$ ✓

$$\Rightarrow P_{LIMIT_c} = \frac{164.8}{2.0} = 82.4 \text{ Lb} \quad \text{(SAFETY FACTOR = 2.0)}$$

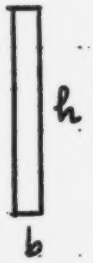
### II. TENSION ~ GROSS AREA STRESS = $F_{tu}$

$$P = \frac{F_{tu}\cdot A}{S.F._u} = \frac{63{,}000\,(.06)(.490)}{2.0}$$

$$\Rightarrow P_{LIMIT_T} = 926.1 \text{ Lb}$$

* C = 2.0 FROM M°DAC ISOGRID DESIGN HDBK, P. 4.8.007

## 5.5 UPPER AND LOWER ISOGRID PANELS (CONT'D)

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BASELINE ISOGRID BAR .07 x .50 $\Rightarrow$ A = .035

$\therefore$ MAINTAINING CURRENT WEIGHT $\Rightarrow$ A = .035

$b * h = .035$ : $b = .035/h$

| b | h | $\frac{bh^3}{12}$ | $\frac{(I/c)}{(I/c)_{REF}}$ | $I/I_{REF}$ |
|---|---|---|---|---|
| .25 | .140 | $57.2 \times 10^{-6}$ | 8.0 | 4.0 |
| .30 | .1167 | $39.7 \times 10^{-6}$ | 4.63 | 2.776 |
| .35 | .100 | $29.2 \times 10^{-6}$ | 2.917 | 2.042 |
| .40 | .0875 | $22.3 \times 10^{-6}$ | 1.949 | 1.559 |
| .45 | .0778 | $17.7 \times 10^{-6}$ | 1.375 | 1.238 |
| .50 | .070 | $14.3 \times 10^{-6}$ | 1.0 | 1.0 |

BENDING ALLOWABLE:

$$F_{tu} = M_{ALL} \frac{c}{I} \qquad b = .07 \text{ , } h = .5 \text{ , } F_{tu} = 42{,}000$$

$$M_{ALL} = \frac{(42{,}000)(.07)(.5)^3}{12(.25)}$$

$\Rightarrow$ $M_{ALL} = 122.5$ IN-LB , BENDING ALLOWABLE WHEN OPEN ISOGRID

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12201 | -186.227 | 0.351 | 0.638 | 0.004 | 1.85 |
| 12202 | 43.806 | 0.083 | 4.304 | 0.027 | HIGH |
| 12204 | -237.117 | 0.447 | 1.421 | 0.009 | 1.23 |
| 12205 | -112.410 | 0.212 | 11.410 | 0.073 | 3.50 |
| 12206 | 139.326 | 0.263 | 7.696 | 0.049 | 2.73 |
| 12207 | -106.389 | 0.201 | 18.790 | 0.120 | 3.44 |
| 12208 | 255.124 | 0.481 | 13.094 | 0.084 | 1.02 |
| 12215 | -179.888 | 0.339 | 1.376 | 0.009 | 1.94 |
| 12216 | -145.008 | 0.274 | 8.517 | 0.054 | 2.57 |
| 12222 | -196.040 | 0.370 | 12.843 | 0.082 | 1.61 |
| 12223 | -184.749 | 0.349 | 12.239 | 0.078 | 1.78 |
| 12224 | -155.406 | 0.293 | 1.053 | 0.007 | 2.41 |
| 12225 | -147.437 | 0.278 | 3.128 | 0.020 | 2.58 |
| 12226 | -147.944 | 0.279 | 3.906 | 0.025 | 2.56 |
| 12227 | -161.521 | 0.305 | 25.036 | 0.160 | 1.90 |
| 12228 | -109.483 | 0.207 | 46.267 | 0.295 | 2.08 |
| 12229 | -181.843 | 0.343 | 62.788 | 0.401 | 0.83 |
| 12230 | -97.140 | 0.183 | 12.827 | 0.082 | 4.11 |
| 12231 | -245.893 | 0.464 | 35.410 | 0.226 | 0.86 |
| 12232 | -63.041 | 0.119 | 14.464 | 0.092 | 6.44 |
| 12233 | -107.853 | 0.203 | 58.942 | 0.376 | 1.60 |
| 12234 | -135.203 | 0.255 | 0.906 | 0.006 | 2.92 |
| 12235 | -122.584 | 0.231 | 1.528 | 0.010 | 3.32 |
| 12236 | -102.987 | 0.194 | 2.622 | 0.017 | 4.13 |
| 12237 | -81.435 | 0.154 | 4.734 | 0.030 | 5.42 |
| 12238 | -36.524 | 0.069 | 16.368 | 0.105 | HIGH |
| 12239 | 100.078 | 0.189 | 34.974 | 0.223 | 2.83 |
| 12240 | -109.155 | 0.206 | 81.377 | 0.520 | 0.91 |
| 12241 | -143.500 | 0.271 | 112.984 | 0.721 | 0.20 |
| 12242 | -111.017 | 0.209 | 64.849 | 0.414 | 1.36 |
| 12243 | -110.412 | 0.208 | 5.148 | 0.033 | 3.74 |
| 12244 | -137.128 | 0.259 | 23.689 | 0.151 | 2.38 |
| 12245 | -112.118 | 0.212 | 3.027 | 0.019 | 3.70 |
| 12246 | -94.511 | 0.178 | 0.637 | 0.004 | 4.61 |
| 12247 | -80.870 | 0.153 | 1.597 | 0.010 | 5.54 |
| 12248 | -57.526 | 0.109 | 2.496 | 0.016 | 8.15 |
| 12249 | 10.429 | 0.020 | 5.378 | 0.034 | HIGH |
| 12250 | 65.761 | 0.124 | 31.886 | 0.204 | 4.38 |
| 12251 | -177.935 | 0.336 | 415.199 | 2.651 | -0.83 |
| 12252 | -20.709 | 0.039 | 1.100 | 0.007 | HIGH |
| 12253 | -132.138 | 0.249 | 389.611 | 2.488 | -0.81 |
| 12254 | -111.760 | 0.211 | 32.305 | 0.206 | 2.65 |
| 12255 | -113.329 | 0.214 | 23.009 | 0.147 | 3.02 |
| 12256 | -108.470 | 0.205 | 19.093 | 0.122 | 3.35 |
| 12257 | -96.874 | 0.183 | 6.475 | 0.041 | 4.36 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12258 | -77.256 | 0.146 | 1.941 | 0.012 | 5.84 |
| 12259 | -56.945 | 0.107 | 3.240 | 0.021 | 8.21 |
| 12260 | -48.419 | 0.091 | 3.442 | 0.022 | 9.80 |
| 12261 | 2.843 | 0.005 | 8.374 | 0.053 | HIGH |
| 12262 | 31.365 | 0.059 | 7.413 | 0.047 | HIGH |
| 12263 | 106.202 | 0.200 | 18.906 | 0.121 | 3.44 |
| 12264 | -36.425 | 0.069 | 231.148 | 1.476 | -0.51 |
| 12265 | -88.988 | 0.168 | 179.445 | 1.146 | -0.30 |
| 12266 | -83.133 | 0.157 | 59.201 | 0.378 | 1.95 |
| 12267 | -78.411 | 0.148 | 15.256 | 0.097 | 5.06 |
| 12268 | -77.504 | 0.146 | 14.497 | 0.093 | 5.18 |
| 12269 | -70.533 | 0.133 | 8.117 | 0.052 | 6.21 |
| 12270 | 13.387 | 0.025 | 5.601 | 0.036 | HIGH |
| 12271 | -6.837 | 0.013 | 0.566 | 0.004 | HIGH |
| 12272 | -26.003 | 0.049 | 0.285 | 0.002 | HIGH |
| 12273 | -42.150 | 0.080 | 0.480 | 0.003 | HIGH |
| 12274 | -43.300 | 0.082 | 0.424 | 0.003 | HIGH |
| 12275 | 91.163 | 0.172 | 4.237 | 0.027 | 4.75 |
| 12278 | -20.741 | 0.039 | 11.738 | 0.075 | HIGH |
| 12279 | -62.280 | 0.118 | 1.256 | 0.008 | 7.49 |
| 12280 | -0.398 | 0.001 | 0.117 | 0.001 | HIGH |
| 12281 | -128.599 | 0.243 | 0.590 | 0.004 | 3.12 |
| 12282 | -150.405 | 0.284 | 4.295 | 0.027 | 2.50 |
| 12283 | -133.028 | 0.251 | 8.433 | 0.054 | 2.89 |
| 12286 | -66.193 | 0.125 | 10.424 | 0.067 | 6.48 |
| 12287 | -77.552 | 0.146 | 0.603 | 0.004 | 5.83 |
| 12288 | -93.368 | 0.176 | 0.453 | 0.003 | 4.68 |
| 12289 | -121.956 | 0.230 | 0.695 | 0.004 | 3.34 |
| 12290 | -164.796 | 0.311 | 3.690 | 0.024 | 2.20 |
| 12293 | -47.296 | 0.089 | 16.352 | 0.104 | 8.22 |
| 12294 | -72.543 | 0.137 | 1.378 | 0.009 | 6.29 |
| 12295 | -11.404 | 0.022 | 0.251 | 0.002 | HIGH |
| 12296 | -112.687 | 0.213 | 4.525 | 0.029 | 3.66 |
| 12297 | -190.817 | 0.360 | 10.895 | 0.070 | 1.71 |
| 12300 | 21.091 | 0.040 | 16.039 | 0.102 | HIGH |
| 12301 | -13.329 | 0.025 | 5.548 | 0.035 | HIGH |
| 12302 | -66.127 | 0.125 | 11.683 | 0.075 | 6.38 |
| 12303 | -78.974 | 0.149 | 21.377 | 0.137 | 4.57 |
| 12304 | -96.511 | 0.182 | 63.729 | 0.407 | 1.57 |
| 12308 | 23.722 | 0.045 | 13.137 | 0.084 | HIGH |
| 12309 | 10.426 | 0.020 | 8.849 | 0.057 | HIGH |
| 12310 | -39.535 | 0.075 | 58.609 | 0.374 | 2.94 |
| 12311 | -101.676 | 0.192 | 111.387 | 0.711 | 0.35 |
| 12312 | -259.534 | 0.490 | 14.926 | 0.095 | 0.98 |
| 12316 | 95.703 | 0.181 | 17.747 | 0.113 | 3.93 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12317 | 79.706 | 0.150 | 285.579 | 1.824 | -0.67 |
| 12318 | -27.126 | 0.051 | 135.020 | 0.862 | 0.22 |
| 12319 | 7.257 | 0.014 | 127.760 | 0.816 | 0.40 |
| 12320 | 14.857 | 0.028 | 25.982 | 0.166 | HIGH |
| 12323 | 187.680 | 0.354 | 215.572 | 1.377 | -0.52 |
| 12324 | 27.542 | 0.052 | 1.666 | 0.011 | HIGH |
| 12325 | 57.901 | 0.109 | 353.147 | 2.255 | -0.77 |
| 12326 | 25.430 | 0.048 | 121.433 | 0.775 | 0.45 |
| 12327 | 348.508 | 0.658 | 9.305 | 0.059 | 0.50 |
| 12329 | 142.805 | 0.269 | 180.179 | 1.151 | -0.35 |
| 12330 | 136.331 | 0.257 | 139.784 | 0.893 | -0.07 |
| 12331 | 116.363 | 0.220 | 91.220 | 0.583 | 0.64 |
| 12332 | 116.482 | 0.220 | 36.959 | 0.235 | 2.34 |
| 12333 | 354.111 | 0.668 | 39.436 | 0.252 | 0.32 |
| 12334 | 169.370 | 0.320 | 122.747 | 0.784 | 0.03 |
| 12335 | 164.720 | 0.311 | 49.451 | 0.316 | 1.25 |
| 12336 | 166.413 | 0.314 | 29.617 | 0.189 | 1.72 |
| 12337 | 207.356 | 0.391 | 14.589 | 0.093 | 1.46 |
| 12338 | 170.297 | 0.321 | 46.464 | 0.297 | 1.27 |
| 12339 | 169.404 | 0.320 | 20.181 | 0.129 | 1.88 |
| 12340 | 177.079 | 0.334 | 13.780 | 0.088 | 1.87 |
| 12341 | 148.481 | 0.280 | 11.427 | 0.073 | 2.44 |
| 12342 | 153.072 | 0.289 | 6.657 | 0.043 | 2.42 |
| 12343 | 105.507 | 0.199 | 3.756 | 0.024 | 3.99 |
| 12346 | 146.272 | 0.276 | 8.453 | 0.054 | 2.55 |
| 12347 | -50.097 | 0.095 | 7.063 | 0.045 | 9.11 |
| 12348 | -127.203 | 0.240 | 20.268 | 0.129 | 2.73 |
| 12349 | -91.005 | 0.172 | 16.422 | 0.105 | 4.23 |
| 12350 | -85.885 | 0.162 | 10.935 | 0.070 | 4.83 |
| 12351 | -81.362 | 0.154 | 11.197 | 0.072 | 5.12 |
| 12353 | -300.437 | 0.567 | 14.706 | 0.094 | 0.72 |
| 12354 | -273.710 | 0.516 | 7.669 | 0.049 | 0.92 |
| 12355 | -134.596 | 0.254 | 75.651 | 0.483 | 0.87 |
| 12356 | -135.124 | 0.255 | 65.250 | 0.417 | 1.12 |
| 12357 | -133.112 | 0.251 | 29.348 | 0.187 | 2.28 |
| 12358 | -131.528 | 0.248 | 31.974 | 0.204 | 2.22 |
| 12361 | -389.208 | 0.734 | 7.757 | 0.050 | 0.35 |
| 12362 | -116.802 | 0.220 | 111.976 | 0.715 | 0.29 |
| 12363 | -148.865 | 0.281 | 132.403 | 0.845 | -0.03 |
| 12364 | -168.697 | 0.318 | 83.575 | 0.534 | 0.53 |
| 12365 | -170.804 | 0.322 | 70.264 | 0.449 | 0.76 |
| 12368 | -7.091 | 0.013 | 25.228 | 0.161 | HIGH |
| 12369 | -80.534 | 0.152 | 78.656 | 0.502 | 1.21 |
| 12370 | -45.930 | 0.087 | 134.007 | 0.856 | 0.18 |
| 12371 | -202.886 | 0.383 | 215.900 | 1.379 | -0.53 |

5.5.9

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12372 | -205.226 | 0.387 | 162.818 | 1.040 | -0.31 |
| 12375 | -46.762 | 0.088 | 20.031 | 0.128 | 7.65 |
| 12376 | -60.197 | 0.114 | 37.981 | 0.243 | 4.07 |
| 12377 | -122.657 | 0.231 | 138.821 | 0.886 | -0.04 |
| 12378 | -42.833 | 0.081 | 1.216 | 0.008 | HIGH |
| 12379 | -178.992 | 0.338 | 170.725 | 1.090 | -0.33 |
| 12383 | 102.035 | 0.193 | 8.787 | 0.056 | 4.03 |
| 12384 | 31.521 | 0.059 | 5.796 | 0.037 | HIGH |
| 12385 | 18.472 | 0.035 | 18.199 | 0.116 | HIGH |
| 12386 | -108.876 | 0.205 | 17.161 | 0.110 | 3.42 |
| 12387 | -115.530 | 0.218 | 48.923 | 0.312 | 1.87 |
| 12390 | 41.828 | 0.079 | 2.148 | 0.014 | HIGH |
| 12391 | 34.243 | 0.065 | 3.428 | 0.022 | HIGH |
| 12392 | 22.359 | 0.042 | 3.813 | 0.024 | HIGH |
| 12393 | -35.092 | 0.066 | 4.192 | 0.027 | HIGH |
| 12394 | -47.919 | 0.090 | 4.860 | 0.031 | 9.79 |
| 12396 | 112.488 | 0.212 | 5.895 | 0.038 | 3.64 |
| 12397 | 102.521 | 0.193 | 2.338 | 0.015 | 4.15 |
| 12398 | 79.369 | 0.150 | 2.256 | 0.014 | 5.65 |
| 12399 | -22.508 | 0.042 | 3.760 | 0.024 | HIGH |
| 12400 | -52.852 | 0.100 | 13.516 | 0.086 | 7.81 |
| 12401 | 124.056 | 0.234 | 2.463 | 0.016 | 3.26 |
| 12402 | 115.862 | 0.219 | 2.431 | 0.016 | 3.56 |
| 12403 | 113.686 | 0.215 | 1.809 | 0.012 | 3.65 |
| 12404 | 94.486 | 0.178 | 1.599 | 0.010 | 4.60 |
| 12405 | -18.647 | 0.035 | 45.770 | 0.292 | 5.61 |
| 12406 | 114.608 | 0.216 | 2.154 | 0.014 | 3.61 |
| 12407 | 85.329 | 0.161 | 2.160 | 0.014 | 5.19 |
| 12408 | 101.846 | 0.192 | 3.165 | 0.020 | 4.17 |
| 12409 | 91.216 | 0.172 | 11.702 | 0.075 | 4.47 |
| 12410 | 94.966 | 0.179 | 2.149 | 0.014 | 4.56 |
| 12411 | 75.427 | 0.142 | 1.677 | 0.011 | 6.01 |
| 12412 | 54.748 | 0.103 | 3.536 | 0.023 | 8.56 |
| 12413 | 60.153 | 0.113 | 4.790 | 0.031 | 7.64 |
| 12414 | 39.904 | 0.075 | 8.497 | 0.054 | HIGH |
| 12415 | 8.049 | 0.015 | 9.069 | 0.058 | HIGH |
| 12425 | -269.788 | 0.509 | 8.088 | 0.052 | 0.94 |
| 12426 | 126.505 | 0.239 | 2.086 | 0.013 | 3.18 |
| 12427 | -164.414 | 0.310 | 3.670 | 0.023 | 2.21 |
| 12443 | -126.273 | 0.238 | 9.414 | 0.060 | 3.07 |
| 12444 | -38.199 | 0.072 | 4.631 | 0.030 | HIGH |
| 12445 | 82.223 | 0.155 | 4.909 | 0.031 | 5.35 |
| 12446 | -53.456 | 0.101 | 7.955 | 0.051 | 8.41 |
| 12447 | 31.625 | 0.060 | 34.854 | 0.223 | 6.59 |
| 12455 | -87.778 | 0.166 | 19.455 | 0.124 | 4.22 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12456 | -294.291 | 0.555 | 47.924 | 0.306 | 0.47 |
| 12463 | -191.193 | 0.361 | 19.376 | 0.124 | 1.59 |
| 12464 | -143.780 | 0.271 | 4.003 | 0.026 | 2.66 |
| 12465 | 29.752 | 0.056 | 10.354 | 0.066 | HIGH |
| 13301 | -203.656 | 0.384 | 3.565 | 0.023 | 1.59 |
| 13302 | 185.701 | 0.350 | 2.097 | 0.013 | 1.85 |
| 13303 | 279.736 | 0.528 | 1.137 | 0.007 | 0.89 |
| 13304 | -329.179 | 0.621 | 1.445 | 0.009 | 0.61 |
| 13305 | 663.768 | 1.252 | 2.451 | 0.016 | -0.20 |
| 13306 | -418.977 | 0.791 | 2.398 | 0.015 | 0.26 |
| 13307 | 440.735 | 0.832 | 2.779 | 0.018 | 0.20 |
| 13308 | -363.627 | 0.686 | 2.315 | 0.015 | 0.46 |
| 13313 | -118.611 | 0.224 | 2.654 | 0.017 | 3.45 |
| 13314 | -215.380 | 0.406 | 1.111 | 0.007 | 1.46 |
| 13319 | 523.292 | 0.987 | 1.891 | 0.012 | 0.01 |
| 13320 | 391.701 | 0.739 | 7.461 | 0.048 | 0.34 |
| 13321 | -135.010 | 0.255 | 1.628 | 0.010 | 2.92 |
| 13322 | -169.524 | 0.320 | 1.258 | 0.008 | 2.12 |
| 13323 | -135.078 | 0.255 | 1.273 | 0.008 | 2.92 |
| 13324 | -34.929 | 0.179 | 1.694 | 0.011 | 4.57 |
| 13325 | -22.797 | 0.043 | 1.145 | 0.007 | HIGH |
| 13326 | 121.455 | 0.229 | 2.010 | 0.013 | 3.35 |
| 13327 | 234.842 | 0.443 | 2.023 | 0.013 | 1.25 |
| 13328 | 336.494 | 0.635 | 1.844 | 0.012 | 0.57 |
| 13329 | 496.990 | 0.938 | 2.952 | 0.019 | 0.07 |
| 13330 | 491.469 | 0.927 | 8.583 | 0.055 | 0.07 |
| 13331 | -92.015 | 0.174 | 1.130 | 0.007 | 4.75 |
| 13332 | -78.832 | 0.149 | 1.075 | 0.007 | 5.72 |
| 13333 | -84.883 | 0.160 | 0.723 | 0.005 | 5.24 |
| 13334 | -47.489 | 0.090 | 1.302 | 0.008 | HIGH |
| 13335 | -20.177 | 0.038 | 1.208 | 0.008 | HIGH |
| 13336 | 31.786 | 0.060 | 1.285 | 0.008 | HIGH |
| 13337 | 98.920 | 0.187 | 1.200 | 0.008 | 4.35 |
| 13338 | 167.935 | 0.317 | 1.649 | 0.011 | 2.15 |
| 13339 | 292.784 | 0.552 | 1.626 | 0.010 | 0.81 |
| 13340 | 351.174 | 0.663 | 3.939 | 0.025 | 0.51 |
| 13341 | 415.231 | 0.783 | 6.645 | 0.042 | 0.27 |
| 13342 | -67.466 | 0.127 | 0.802 | 0.005 | 6.85 |
| 13343 | -35.824 | 0.068 | 0.516 | 0.003 | HIGH |
| 13344 | -46.860 | 0.088 | 0.362 | 0.002 | HIGH |
| 13345 | -33.690 | 0.064 | 0.729 | 0.005 | HIGH |
| 13346 | -11.536 | 0.022 | 0.847 | 0.005 | HIGH |
| 13347 | 9.794 | 0.018 | 0.855 | 0.005 | HIGH |
| 13348 | 38.099 | 0.072 | 0.626 | 0.004 | HIGH |
| 13349 | 94.126 | 0.178 | 1.289 | 0.008 | 4.62 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13350 | 159.832 | 0.302 | 1.336 | 0.009 | 2.31 |
| 13351 | 233.804 | 0.441 | 1.074 | 0.007 | 1.27 |
| 13352 | 259.650 | 0.490 | 3.657 | 0.023 | 1.04 |
| 13353 | 338.442 | 0.639 | 3.270 | 0.021 | 0.56 |
| 13354 | -70.905 | 0.134 | 0.653 | 0.004 | 6.47 |
| 13355 | -27.085 | 0.051 | 0.263 | 0.002 | HIGH |
| 13356 | -29.495 | 0.056 | 0.132 | 0.001 | HIGH |
| 13357 | -22.025 | 0.042 | 0.295 | 0.002 | HIGH |
| 13358 | -8.150 | 0.015 | 0.491 | 0.003 | HIGH |
| 13359 | 7.345 | 0.014 | 0.500 | 0.003 | HIGH |
| 13360 | 22.622 | 0.043 | 0.412 | 0.003 | HIGH |
| 13361 | 47.022 | 0.089 | 0.791 | 0.005 | HIGH |
| 13362 | 87.519 | 0.165 | 0.952 | 0.006 | 5.05 |
| 13363 | 143.312 | 0.270 | 0.951 | 0.006 | 2.70 |
| 13364 | 189.750 | 0.358 | 1.275 | 0.008 | 1.79 |
| 13365 | 205.915 | 0.389 | 2.472 | 0.016 | 1.57 |
| 13366 | 265.566 | 0.501 | 1.505 | 0.010 | 0.99 |
| 13367 | -90.084 | 0.170 | 20.907 | 0.134 | 4.01 |
| 13368 | -42.473 | 0.080 | 0.381 | 0.002 | HIGH |
| 13369 | -23.714 | 0.045 | 0.392 | 0.003 | HIGH |
| 13370 | -13.075 | 0.025 | 0.129 | 0.001 | HIGH |
| 13371 | -2.250 | 0.004 | 0.191 | 0.001 | HIGH |
| 13372 | 8.985 | 0.017 | 0.238 | 0.002 | HIGH |
| 13373 | 19.591 | 0.037 | 0.251 | 0.002 | HIGH |
| 13374 | 31.692 | 0.060 | 0.325 | 0.002 | HIGH |
| 13375 | 41.455 | 0.078 | 0.695 | 0.004 | HIGH |
| 13376 | 82.974 | 0.157 | 0.704 | 0.004 | 5.38 |
| 13377 | 121.136 | 0.229 | 0.561 | 0.004 | 3.37 |
| 13378 | 156.908 | 0.296 | 0.621 | 0.004 | 2.38 |
| 13379 | 177.797 | 0.335 | 2.816 | 0.018 | 1.97 |
| 13380 | 180.450 | 0.340 | 20.211 | 0.129 | 1.72 |
| 13382 | 2.993 | 0.006 | 5.175 | 0.033 | HIGH |
| 13383 | 7.101 | 0.013 | 2.121 | 0.014 | HIGH |
| 13384 | 6.655 | 0.013 | 0.227 | 0.001 | HIGH |
| 13385 | 10.804 | 0.020 | 0.065 | 0.000 | HIGH |
| 13386 | 16.344 | 0.031 | 0.106 | 0.001 | HIGH |
| 13387 | 22.208 | 0.042 | 0.138 | 0.001 | HIGH |
| 13388 | 26.983 | 0.051 | 0.142 | 0.001 | HIGH |
| 13389 | 29.900 | 0.056 | 0.218 | 0.001 | HIGH |
| 13390 | 37.985 | 0.072 | 0.352 | 0.002 | HIGH |
| 13391 | 56.634 | 0.107 | 0.457 | 0.003 | 8.36 |
| 13392 | 81.401 | 0.154 | 0.395 | 0.003 | 5.51 |
| 13393 | 104.283 | 0.197 | 1.923 | 0.012 | 4.07 |
| 13394 | 123.350 | 0.233 | 6.941 | 0.044 | 3.22 |
| 13397 | -226.669 | 0.428 | 11.087 | 0.071 | 1.29 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13398 | -226.217 | 0.427 | 2.807 | 0.018 | 1.34 |
| 13399 | -205.329 | 0.387 | 0.742 | 0.005 | 1.58 |
| 13400 | -171.041 | 0.323 | 0.759 | 0.005 | 2.10 |
| 13401 | -119.077 | 0.225 | 0.630 | 0.004 | 3.45 |
| 13402 | -22.317 | 0.042 | 0.805 | 0.005 | HIGH |
| 13403 | 179.505 | 0.339 | 3.362 | 0.021 | 1.94 |
| 13406 | -161.247 | 0.304 | 4.170 | 0.027 | 2.27 |
| 13407 | -182.840 | 0.345 | 1.421 | 0.009 | 1.90 |
| 13408 | -201.661 | 0.380 | 0.917 | 0.006 | 1.63 |
| 13409 | -199.421 | 0.376 | 1.183 | 0.008 | 1.66 |
| 13410 | -188.603 | 0.356 | 1.207 | 0.008 | 1.81 |
| 13411 | -182.746 | 0.345 | 0.925 | 0.006 | 1.90 |
| 13412 | -180.508 | 0.341 | 4.414 | 0.028 | 1.92 |
| 13413 | 52.459 | 0.099 | 8.301 | 0.053 | 8.54 |
| 13415 | -173.839 | 0.328 | 0.900 | 0.006 | 2.05 |
| 13416 | -194.562 | 0.367 | 1.285 | 0.008 | 1.72 |
| 13417 | -205.301 | 0.387 | 1.460 | 0.009 | 1.58 |
| 13418 | -212.897 | 0.402 | 1.485 | 0.009 | 1.49 |
| 13419 | -226.176 | 0.427 | 1.388 | 0.009 | 1.34 |
| 13420 | -263.553 | 0.497 | 1.600 | 0.010 | 1.01 |
| 13421 | -262.709 | 0.496 | 7.185 | 0.046 | 1.00 |
| 13424 | -179.124 | 0.338 | 1.439 | 0.009 | 1.96 |
| 13425 | -206.904 | 0.390 | 1.644 | 0.010 | 1.56 |
| 13426 | -217.823 | 0.411 | 1.657 | 0.011 | 1.43 |
| 13427 | -231.783 | 0.437 | 1.677 | 0.011 | 1.28 |
| 13428 | -254.017 | 0.479 | 1.235 | 0.008 | 1.09 |
| 13429 | -281.291 | 0.531 | 2.058 | 0.013 | 0.88 |
| 13430 | -333.689 | 0.630 | 2.294 | 0.015 | 0.59 |
| 13432 | -193.187 | 0.365 | 1.812 | 0.012 | 1.74 |
| 13433 | -224.924 | 0.424 | 1.829 | 0.012 | 1.35 |
| 13434 | -236.260 | 0.446 | 1.845 | 0.012 | 1.24 |
| 13435 | -251.778 | 0.475 | 1.631 | 0.010 | 1.10 |
| 13436 | -273.213 | 0.515 | 0.926 | 0.006 | 0.94 |
| 13437 | -325.029 | 0.613 | 2.636 | 0.017 | 0.63 |
| 13438 | -353.112 | 0.666 | 5.437 | 0.035 | 0.49 |
| 13440 | -213.964 | 0.404 | 2.031 | 0.013 | 1.47 |
| 13441 | -248.949 | 0.470 | 1.967 | 0.013 | 1.13 |
| 13442 | -259.676 | 0.490 | 1.905 | 0.012 | 1.04 |
| 13443 | -274.962 | 0.519 | 1.486 | 0.009 | 0.93 |
| 13444 | -303.274 | 0.572 | 0.610 | 0.004 | 0.75 |
| 13445 | -370.346 | 0.699 | 0.769 | 0.005 | 0.43 |
| 13446 | -404.902 | 0.764 | 8.427 | 0.054 | 0.30 |
| 13450 | -240.531 | 0.454 | 2.171 | 0.014 | 1.20 |
| 13451 | -278.098 | 0.525 | 2.104 | 0.013 | 0.90 |
| 13452 | -290.264 | 0.548 | 1.953 | 0.012 | 0.82 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13453 | -314.729 | 0.594 | 1.307 | 0.008 | 0.68 |
| 13454 | -357.193 | 0.674 | 0.403 | 0.003 | 0.48 |
| 13455 | -426.093 | 0.804 | 0.588 | 0.004 | 0.24 |
| 13456 | -465.829 | 0.879 | 1.733 | 0.011 | 0.14 |
| 13457 | 216.674 | 0.409 | 10.620 | 0.068 | 1.39 |
| 13459 | -267.633 | 0.505 | 2.496 | 0.016 | 0.98 |
| 13460 | -307.469 | 0.580 | 2.378 | 0.015 | 0.72 |
| 13461 | -322.263 | 0.608 | 2.081 | 0.013 | 0.64 |
| 13462 | -377.666 | 0.713 | 1.226 | 0.008 | 0.40 |
| 13463 | -448.607 | 0.846 | 0.301 | 0.002 | 0.18 |
| 13464 | -572.992 | 1.081 | 0.240 | 0.002 | -0.08 |
| 13465 | -672.239 | 1.268 | 1.762 | 0.011 | -0.21 |
| 13467 | -287.593 | 0.543 | 2.986 | 0.019 | 0.84 |
| 13468 | -335.179 | 0.632 | 2.829 | 0.018 | 0.58 |
| 13469 | -364.575 | 0.688 | 2.222 | 0.014 | 0.45 |
| 13470 | -420.217 | 0.793 | 1.243 | 0.008 | 0.26 |
| 13471 | -493.973 | 0.932 | 0.922 | 0.006 | 0.07 |
| 13472 | -552.197 | 1.042 | 2.449 | 0.016 | -0.04 |
| 13473 | -451.731 | 0.852 | 4.970 | 0.032 | 0.17 |
| 13474 | -292.076 | 0.551 | 3.878 | 0.025 | 0.81 |
| 13475 | -349.708 | 0.660 | 3.169 | 0.020 | 0.51 |
| 13476 | -387.792 | 0.732 | 2.158 | 0.014 | 0.37 |
| 13477 | -434.123 | 0.819 | 0.914 | 0.006 | 0.22 |
| 13478 | -459.971 | 0.868 | 3.252 | 0.021 | 0.15 |
| 13479 | -437.759 | 0.826 | 9.576 | 0.061 | 0.20 |
| 13480 | -291.582 | 0.550 | 4.491 | 0.029 | 0.81 |
| 13481 | -352.398 | 0.665 | 3.183 | 0.020 | 0.50 |
| 13482 | -388.095 | 0.732 | 1.463 | 0.009 | 0.37 |
| 13483 | -404.288 | 0.763 | 2.880 | 0.018 | 0.31 |
| 13484 | -404.844 | 0.764 | 10.821 | 0.069 | 0.29 |
| 13485 | -282.597 | 0.533 | 4.417 | 0.028 | 0.87 |
| 13486 | -337.842 | 0.637 | 2.941 | 0.019 | 0.57 |
| 13487 | -358.711 | 0.677 | 1.069 | 0.007 | 0.48 |
| 13488 | -351.910 | 0.664 | 8.478 | 0.054 | 0.49 |
| 13489 | -254.319 | 0.480 | 5.226 | 0.033 | 1.07 |
| 13490 | -302.165 | 0.570 | 5.822 | 0.037 | 0.74 |
| 13491 | -257.174 | 0.485 | 0.711 | 0.005 | 1.06 |
| 13492 | -289.948 | 0.547 | 20.060 | 0.128 | 0.74 |
| 13499 | -275.193 | 0.519 | 2.086 | 0.013 | 0.92 |
| 13500 | 37.561 | 0.071 | 1.212 | 0.008 | HIGH |
| 13501 | 153.468 | 0.290 | 1.701 | 0.011 | 2.45 |
| 13502 | 200.357 | 0.378 | 1.181 | 0.008 | 1.64 |
| 13503 | 227.856 | 0.430 | 0.359 | 0.002 | 1.33 |
| 13504 | 265.647 | 0.501 | 3.971 | 0.025 | 0.99 |
| 13505 | 334.444 | 0.631 | 15.188 | 0.097 | 0.54 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13509 | 473.428 | 0.893 | 5.458 | 0.035 | 0.12 |
| 13510 | 382.514 | 0.722 | 0.931 | 0.006 | 0.39 |
| 13511 | 324.353 | 0.612 | 0.944 | 0.006 | 0.63 |
| 13512 | 298.584 | 0.563 | 0.930 | 0.006 | 0.77 |
| 13513 | 282.460 | 0.533 | 0.562 | 0.004 | 0.88 |
| 13514 | 261.637 | 0.494 | 1.912 | 0.012 | 1.02 |
| 13515 | 211.808 | 0.400 | 6.382 | 0.041 | 1.48 |
| 13518 | 621.341 | 1.172 | 4.906 | 0.031 | -0.15 |
| 13519 | 576.851 | 1.088 | 1.399 | 0.009 | -0.08 |
| 13520 | 452.534 | 0.854 | 0.455 | 0.003 | 0.17 |
| 13521 | 378.830 | 0.715 | 0.426 | 0.003 | 0.40 |
| 13522 | 332.548 | 0.627 | 0.270 | 0.002 | 0.59 |
| 13523 | 296.895 | 0.560 | 0.244 | 0.002 | 0.79 |
| 13524 | 239.677 | 0.452 | 1.329 | 0.008 | 1.21 |
| 13526 | 654.657 | 1.235 | 10.323 | 0.066 | -0.20 |
| 13527 | 578.132 | 1.091 | 0.584 | 0.004 | -0.08 |
| 13528 | 509.421 | 0.961 | 0.479 | 0.003 | 0.04 |
| 13529 | 432.690 | 0.816 | 0.313 | 0.002 | 0.22 |
| 13530 | 377.106 | 0.712 | 0.580 | 0.004 | 0.41 |
| 13531 | 339.083 | 0.640 | 0.716 | 0.005 | 0.56 |
| 13532 | 277.670 | 0.524 | 0.770 | 0.005 | 0.91 |
| 13534 | 581.479 | 1.097 | 6.948 | 0.044 | -0.09 |
| 13535 | 550.541 | 1.039 | 5.170 | 0.033 | -0.04 |
| 13536 | 483.668 | 0.913 | 0.737 | 0.005 | 0.10 |
| 13537 | 434.600 | 0.820 | 0.881 | 0.006 | 0.22 |
| 13538 | 402.880 | 0.760 | 1.013 | 0.006 | 0.32 |
| 13539 | 367.316 | 0.693 | 1.330 | 0.008 | 0.44 |
| 13540 | 310.622 | 0.586 | 1.583 | 0.010 | 0.71 |
| 13544 | 518.710 | 0.979 | 9.703 | 0.062 | 0.01 |
| 13545 | 487.384 | 0.920 | 2.999 | 0.019 | 0.09 |
| 13546 | 435.583 | 0.822 | 1.660 | 0.011 | 0.22 |
| 13547 | 407.376 | 0.769 | 1.020 | 0.007 | 0.30 |
| 13548 | 383.083 | 0.723 | 1.348 | 0.009 | 0.38 |
| 13549 | 363.409 | 0.686 | 1.672 | 0.011 | 0.46 |
| 13550 | 317.399 | 0.599 | 2.479 | 0.016 | 0.67 |
| 13553 | 416.844 | 0.786 | 3.988 | 0.025 | 0.27 |
| 13554 | 410.834 | 0.775 | 3.638 | 0.023 | 0.29 |
| 13555 | 383.614 | 0.724 | 1.898 | 0.012 | 0.38 |
| 13556 | 362.383 | 0.684 | 0.692 | 0.004 | 0.46 |
| 13557 | 347.137 | 0.655 | 1.405 | 0.009 | 0.53 |
| 13558 | 335.079 | 0.632 | 1.815 | 0.012 | 0.58 |
| 13559 | 296.793 | 0.560 | 2.307 | 0.015 | 0.78 |
| 13561 | 391.241 | 0.738 | 2.839 | 0.018 | 0.35 |
| 13562 | 384.883 | 0.726 | 2.688 | 0.017 | 0.38 |
| 13563 | 347.655 | 0.656 | 2.098 | 0.013 | 0.52 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13564 | 325.596 | 0.614 | 0.957 | 0.006 | 0.63 |
| 13565 | 310.143 | 0.585 | 1.134 | 0.007 | 0.71 |
| 13566 | 299.608 | 0.565 | 1.765 | 0.011 | 0.77 |
| 13567 | 263.146 | 0.497 | 2.004 | 0.013 | 1.01 |
| 13568 | 226.097 | 0.427 | 1.378 | 0.009 | 1.34 |
| 13569 | 299.432 | 0.565 | 1.880 | 0.012 | 0.77 |
| 13570 | 305.456 | 0.576 | 1.816 | 0.012 | 0.73 |
| 13571 | 292.337 | 0.552 | 1.231 | 0.008 | 0.81 |
| 13572 | 278.526 | 0.526 | 0.687 | 0.004 | 0.90 |
| 13573 | 267.361 | 0.504 | 1.536 | 0.010 | 0.98 |
| 13574 | 233.353 | 0.440 | 2.057 | 0.013 | 1.27 |
| 13575 | 225.915 | 0.426 | 0.847 | 0.005 | 1.35 |
| 13576 | 247.076 | 0.466 | 1.163 | 0.007 | 1.14 |
| 13577 | 258.058 | 0.487 | 1.140 | 0.007 | 1.05 |
| 13578 | 250.629 | 0.473 | 0.564 | 0.004 | 1.11 |
| 13579 | 239.868 | 0.453 | 1.133 | 0.007 | 1.21 |
| 13580 | 209.023 | 0.394 | 2.104 | 0.013 | 1.53 |
| 13581 | 220.756 | 0.417 | 0.776 | 0.005 | 1.40 |
| 13582 | 221.478 | 0.418 | 0.586 | 0.004 | 1.39 |
| 13583 | 223.890 | 0.422 | 0.604 | 0.004 | 1.37 |
| 13584 | 213.326 | 0.403 | 0.620 | 0.004 | 1.48 |
| 13585 | 186.033 | 0.351 | 1.723 | 0.011 | 1.85 |
| 13586 | 211.503 | 0.399 | 0.911 | 0.006 | 1.51 |
| 13587 | 199.842 | 0.377 | 1.349 | 0.009 | 1.65 |
| 13588 | 181.208 | 0.342 | 0.467 | 0.003 | 1.92 |
| 13589 | 160.015 | 0.302 | 1.020 | 0.007 | 2.31 |
| 13590 | 165.793 | 0.313 | 2.794 | 0.018 | 2.19 |
| 13591 | 146.801 | 0.277 | 2.670 | 0.017 | 2.60 |
| 13592 | 123.657 | 0.233 | 1.235 | 0.008 | 3.28 |
| 13594 | 164.781 | 0.311 | 12.638 | 0.081 | 2.09 |
| 22201 | 188.792 | 0.356 | 13.082 | 0.084 | 1.71 |
| 22202 | -94.138 | 0.178 | 4.202 | 0.027 | 4.57 |
| 22203 | -29.589 | 0.056 | 2.567 | 0.016 | HIGH |
| 22204 | 199.167 | 0.376 | 4.460 | 0.028 | 1.65 |
| 22205 | 149.551 | 0.282 | 21.218 | 0.135 | 2.20 |
| 22206 | 10.424 | 0.020 | 18.346 | 0.117 | HIGH |
| 22207 | 178.547 | 0.337 | 10.946 | 0.070 | 1.89 |
| 22208 | -74.367 | 0.140 | 32.252 | 0.206 | 3.92 |
| 22215 | 161.763 | 0.305 | 22.495 | 0.144 | 1.95 |
| 22216 | 178.486 | 0.337 | 3.284 | 0.021 | 1.96 |
| 22222 | 162.690 | 0.307 | 48.196 | 0.308 | 1.30 |
| 22223 | 210.443 | 0.397 | 68.390 | 0.437 | 0.58 |
| 22224 | 159.568 | 0.301 | 23.465 | 0.150 | 1.97 |
| 22225 | 146.212 | 0.276 | 7.175 | 0.046 | 2.57 |
| 22226 | 120.592 | 0.228 | 3.619 | 0.023 | 3.37 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22227 | 117.258 | 0.221 | 4.696 | 0.030 | 3.48 |
| 22228 | 103.028 | 0.194 | 7.859 | 0.050 | 4.01 |
| 22229 | 98.053 | 0.185 | 16.683. | 0.107 | 3.88 |
| 22230 | 114.115 | 0.215 | 20.108 | 0.128 | 3.12 |
| 22231 | 136.258 | 0.257 | 73.560 | 0.470 | 0.91 |
| 22232 | 179.492 | 0.339 | 103.706 | 0.662 | 0.21 |
| 22233 | 124.902 | 0.236 | 143.096 | 0.914 | -0.08 |
| 22234 | 102.652 | 0.194 | 9.925 | 0.063 | 3.96 |
| 22235 | 92.007 | 0.174 | 7.125 | 0.046 | 4.62 |
| 22236 | 90.498 | 0.171 | 2.760 | 0.018 | 4.83 |
| 22237 | 80.031 | 0.151 | 5.900 | 0.038 | 5.48 |
| 22238 | 73.618 | 0.139 | 11.001 | 0.070 | 5.73 |
| 22239 | 68.504 | 0.129 | 19.732 | 0.126 | 5.41 |
| 22240 | 75.145 | 0.142 | 21.742 | 0.139 | 4.77 |
| 22241 | 92.651 | 0.175 | 25.929 | 0.166 | 3.59 |
| 22242 | 126.518 | 0.239 | 295.922 | 1.890 | -0.70 |
| 22243 | 11.549 | 0.022 | 2.247 | 0.014 | HIGH |
| 22244 | 96.429 | 0.182 | 411.377 | 2.627 | -0.82 |
| 22245 | 81.115 | 0.153 | 6.884 | 0.044 | 5.36 |
| 22246 | 12.132 | 0.023 | 1.952 | 0.012 | HIGH |
| 22247 | 69.624 | 0.131 | 4.976 | 0.032 | 6.48 |
| 22248 | 53.367 | 0.101 | 3.655 | 0.023 | 8.80 |
| 22249 | 45.434 | 0.086 | 7.145 | 0.046 | HIGH |
| 22250 | 38.290 | 0.072 | 14.189 | 0.091 | HIGH |
| 22251 | 37.284 | 0.070 | 19.770 | 0.126 | 9.30 |
| 22252 | 38.791 | 0.073 | 22.442 | 0.143 | 8.38 |
| 22253 | 38.346 | 0.072 | 63.028 | 0.402 | 2.63 |
| 22254 | 19.833 | 0.037 | 192.534 | 1.229 | -0.32 |
| 22255 | 14.366 | 0.027 | 186.178 | 1.189 | -0.28 |
| 22256 | -1.102 | 0.002 | 18.815 | 0.120 | HIGH |
| 22257 | 39.323 | 0.074 | 2.911 | 0.019 | HIGH |
| 22258 | 19.366 | 0.037 | 2.063 | 0.013 | HIGH |
| 22259 | 37.272 | 0.070 | 0.557 | 0.004 | HIGH |
| 22260 | 9.303 | 0.018 | 2.080 | 0.013 | HIGH |
| 22261 | 15.606 | 0.029 | 1.964 | 0.013 | HIGH |
| 22262 | 5.427 | 0.010 | 3.892 | 0.025 | HIGH |
| 22263 | 7.194 | 0.014 | 9.192 | 0.059 | HIGH |
| 22264 | 2.785 | 0.005 | 10.296 | 0.066 | HIGH |
| 22265 | -2.385 | 0.004 | 10.378 | 0.066 | HIGH |
| 22266 | -12.233 | 0.023 | 52.478 | 0.335 | 4.86 |
| 22267 | -17.630 | 0.033 | 88.198 | 0.563 | 1.50 |
| 22268 | -21.325 | 0.040 | 48.875 | 0.312 | 4.86 |
| 22269 | -41.071 | 0.077 | 15.252 | 0.097 | 9.59 |
| 22270 | 33.928 | 0.064 | 3.497 | 0.022 | HIGH |
| 22271 | 56.471 | 0.107 | 3.220 | 0.021 | 8.29 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22272 | 31.985 | 0.060 | 3.373 | 0.022 | HIGH |
| 22273 | 44.404 | 0.084 | 4.703 | 0.030 | HIGH |
| 22274 | 71.981 | 0.136 | 4.072 | 0.026 | 6.27 |
| 22275 | -41.056 | 0.077 | 9.589 | 0.061 | HIGH |
| 22278 | 35.507 | 0.067 | 4.681 | 0.030 | HIGH |
| 22279 | 80.458 | 0.152 | 4.490 | 0.029 | 5.50 |
| 22280 | 114.708 | 0.216 | 3.658 | 0.023 | 3.59 |
| 22281 | 116.740 | 0.220 | 3.939 | 0.025 | 3.51 |
| 22282 | 149.773 | 0.283 | 5.933 | 0.038 | 2.50 |
| 22283 | 52.442 | 0.099 | 9.824 | 0.063 | 8.36 |
| 22286 | 87.589 | 0.165 | 10.928 | 0.070 | 4.72 |
| 22287 | 114.049 | 0.215 | 3.545 | 0.023 | 3.62 |
| 22288 | 130.526 | 0.246 | 2.092 | 0.013 | 3.05 |
| 22289 | 141.261 | 0.267 | 2.068 | 0.013 | 2.74 |
| 22290 | 149.480 | 0.282 | 10.203 | 0.065 | 2.44 |
| 22293 | 131.115 | 0.247 | 16.038 | 0.102 | 2.76 |
| 22294 | 124.988 | 0.236 | 3.240 | 0.021 | 3.22 |
| 22295 | 133.054 | 0.251 | 1.260 | 0.008 | 2.98 |
| 22296 | 139.650 | 0.263 | 1.363 | 0.009 | 2.79 |
| 22297 | 156.464 | 0.295 | 7.198 | 0.046 | 2.34 |
| 22300 | 96.721 | 0.182 | 7.551 | 0.048 | 4.33 |
| 22301 | 108.130 | 0.204 | 5.714 | 0.036 | 3.83 |
| 22302 | 115.383 | 0.218 | 4.557 | 0.029 | 3.55 |
| 22303 | 120.598 | 0.228 | 7.662 | 0.049 | 3.30 |
| 22304 | 126.438 | 0.239 | 10.907 | 0.070 | 3.03 |
| 22308 | 74.749 | 0.141 | 10.739 | 0.069 | 5.66 |
| 22309 | 88.857 | 0.168 | 13.767 | 0.088 | 4.50 |
| 22310 | 89.949 | 0.170 | 15.719 | 0.100 | 4.33 |
| 22311 | 83.412 | 0.157 | 21.477 | 0.137 | 4.31 |
| 22312 | 67.302 | 0.127 | 31.676 | 0.202 | 4.32 |
| 22316 | 56.854 | 0.107 | 25.058 | 0.160 | 5.77 |
| 22317 | 61.724 | 0.116 | 24.998 | 0.160 | 5.38 |
| 22318 | 60.354 | 0.114 | 38.715 | 0.247 | 3.99 |
| 22319 | 43.094 | 0.081 | 42.515 | 0.271 | 4.45 |
| 22320 | 25.562 | 0.048 | 40.502 | 0.259 | 6.04 |
| 22323 | 32.374 | 0.061 | 44.782 | 0.286 | 4.78 |
| 22324 | 37.721 | 0.071 | 39.434 | 0.252 | 5.22 |
| 22325 | 38.405 | 0.072 | 86.508 | 0.552 | 1.35 |
| 22326 | 5.078 | 0.010 | 110.988 | 0.709 | 0.80 |
| 22327 | -27.459 | 0.052 | 41.854 | 0.267 | 5.62 |
| 22329 | 14.062 | 0.027 | 96.561 | 0.617 | 1.19 |
| 22330 | 23.849 | 0.045 | 88.167 | 0.563 | 1.43 |
| 22331 | 42.642 | 0.080 | 177.465 | 1.133 | -0.25 |
| 22332 | 37.392 | 0.071 | 169.163 | 1.080 | -0.18 |
| 22333 | -49.417 | 0.093 | 43.449 | 0.277 | 4.02 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22334 | -2.755 | 0.005 | 148.937 | 0.951 | 0.09 |
| 22335 | 1.914 | 0.004 | 352.086 | 2.248 | -0.76 |
| 22336 | -1.972 | 0.004 | 0.331 | 0.002 | HIGH |
| 22337 | 73.014 | 0.138 | 324.489 | 2.072 | -0.73 |
| 22338 | -21.407 | 0.040 | 101.385 | 0.647 | 0.97 |
| 22339 | -18.695 | 0.035 | 127.992 | 0.817 | 0.36 |
| 22340 | 52.729 | 0.099 | 37.672 | 0.241 | 4.49 |
| 22341 | -43.720 | 0.082 | 11.372 | 0.073 | 9.79 |
| 22342 | -28.244 | 0.053 | 7.574 | 0.048 | HIGH |
| 22343 | -49.564 | 0.094 | 4.360 | 0.028 | 9.48 |
| 22346 | 1.183 | 0.002 | 65.280 | 0.417 | 3.58 |
| 22347 | 46.704 | 0.088 | 156.156 | 0.997 | -0.08 |
| 22348 | 56.507 | 0.107 | 45.422 | 0.290 | 3.52 |
| 22349 | 26.244 | 0.050 | 156.171 | 0.997 | -0.04 |
| 22350 | 38.846 | 0.073 | 2.839 | 0.018 | HIGH |
| 22351 | 54.179 | 0.102 | 10.866 | 0.069 | 7.96 |
| 22353 | 70.900 | 0.134 | 126.904 | 0.810 | 0.21 |
| 22354 | 105.083 | 0.198 | 46.047 | 0.294 | 2.17 |
| 22355 | 56.741 | 0.107 | 158.809 | 1.014 | -0.12 |
| 22356 | 6.652 | 0.013 | 0.338 | 0.002 | HIGH |
| 22357 | 42.098 | 0.079 | 167.997 | 1.073 | -0.17 |
| 22358 | 46.157 | 0.087 | 58.259 | 0.372 | 2.78 |
| 22361 | 80.301 | 0.152 | 79.531 | 0.508 | 1.19 |
| 22362 | 55.590 | 0.105 | 54.155 | 0.346 | 2.83 |
| 22363 | 21.603 | 0.041 | 78.310 | 0.500 | 1.96 |
| 22364 | 39.409 | 0.074 | 71.959 | 0.460 | 2.02 |
| 22365 | 45.390 | 0.086 | 137.248 | 0.876 | 0.14 |
| 22368 | 53.893 | 0.102 | 41.559 | 0.265 | 4.00 |
| 22369 | 41.065 | 0.077 | 24.842 | 0.159 | 7.52 |
| 22370 | 23.458 | 0.044 | 57.866 | 0.370 | 3.56 |
| 22371 | 23.554 | 0.044 | 59.947 | 0.383 | 3.33 |
| 22372 | 33.986 | 0.064 | 122.564 | 0.783 | 0.40 |
| 22375 | 8.657 | 0.016 | 18.357 | 0.117 | HIGH |
| 22376 | 12.390 | 0.023 | 17.599 | 0.112 | HIGH |
| 22377 | 5.685 | 0.011 | 27.714 | 0.177 | HIGH |
| 22378 | 3.998 | 0.008 | 30.288 | 0.193 | HIGH |
| 22379 | 9.486 | 0.018 | 68.629 | 0.438 | 2.94 |
| 22383 | -35.986 | 0.068 | 6.779 | 0.043 | HIGH |
| 22384 | -27.150 | 0.051 | 7.113 | 0.045 | HIGH |
| 22385 | -22.138 | 0.042 | 9.367 | 0.060 | HIGH |
| 22386 | -21.253 | 0.040 | 10.352 | 0.066 | HIGH |
| 22387 | -16.527 | 0.031 | 30.084 | 0.192 | HIGH |
| 22390 | -61.665 | 0.116 | 1.710 | 0.011 | 7.57 |
| 22391 | -60.745 | 0.115 | 1.643 | 0.010 | 7.70 |
| 22392 | -54.481 | 0.103 | 1.540 | 0.010 | 8.70 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22393 | -47.502 | 0.090 | 1.293 | 0.008 | HIGH |
| 22394 | -38.034 | 0.072 | 14.100 | 0.090 | HIGH |
| 22396 | -106.210 | 0.200 | 4.901 | 0.031 | 3.93 |
| 22397 | -91.487 | 0.173 | 2.759 | 0.018 | 4.76 |
| 22398 | -81.198 | 0.153 | 2.037 | 0.013 | 5.51 |
| 22399 | -73.491 | 0.139 | 3.547 | 0.023 | 6.14 |
| 22400 | -62.685 | 0.118 | 7.450 | 0.048 | 7.12 |
| 22401 | -107.761 | 0.203 | 9.003 | 0.057 | 3.76 |
| 22402 | -94.672 | 0.179 | 7.802 | 0.050 | 4.44 |
| 22403 | -93.432 | 0.176 | 2.465 | 0.016 | 4.65 |
| 22404 | -77.610 | 0.146 | 6.759 | 0.043 | 5.64 |
| 22405 | -83.179 | 0.157 | 7.723 | 0.049 | 5.17 |
| 22406 | -87.417 | 0.165 | 22.943 | 0.147 | 4.01 |
| 22407 | -73.948 | 0.140 | 7.654 | 0.049 | 5.92 |
| 22408 | -61.413 | 0.116 | 6.547 | 0.042 | 7.35 |
| 22409 | -53.301 | 0.101 | 16.499 | 0.105 | 7.33 |
| 22410 | -78.418 | 0.148 | 18.841 | 0.120 | 4.80 |
| 22411 | -41.061 | 0.077 | 2.758 | 0.018 | HIGH |
| 22412 | -64.759 | 0.122 | 16.173 | 0.103 | 6.09 |
| 22413 | -60.492 | 0.114 | 8.807 | 0.056 | 7.29 |
| 22414 | -37.094 | 0.070 | 8.626 | 0.055 | HIGH |
| 22415 | -23.705 | 0.045 | 3.064 | 0.020 | HIGH |
| 23301 | 135.884 | 0.256 | 1.649 | 0.011 | 2.90 |
| 23302 | 45.155 | 0.085 | 9.023 | 0.058 | 9.87 |
| 23303 | -64.215 | 0.121 | 11.477 | 0.073 | 6.61 |
| 23304 | 115.621 | 0.218 | 5.127 | 0.033 | 3.53 |
| 23305 | 29.182 | 0.055 | 4.130 | 0.026 | HIGH |
| 23306 | 48.529 | 0.092 | 11.155 | 0.071 | 8.86 |
| 23307 | 143.053 | 0.270 | 6.892 | 0.044 | 2.65 |
| 23308 | 78.651 | 0.148 | 8.743 | 0.056 | 5.46 |
| 23313 | 50.898 | 0.096 | 3.964 | 0.025 | 9.24 |
| 23314 | 125.154 | 0.236 | 5.290 | 0.034 | 3.19 |
| 23319 | 88.117 | 0.166 | 6.643 | 0.042 | 4.87 |
| 23320 | 77.717 | 0.147 | 9.648 | 0.062 | 5.48 |
| 23321 | 27.456 | 0.052 | 6.663 | 0.043 | HIGH |
| 23322 | 96.081 | 0.181 | 4.624 | 0.030 | 4.45 |
| 23323 | 107.906 | 0.204 | 7.579 | 0.048 | 3.79 |
| 23324 | 107.694 | 0.203 | 11.729 | 0.075 | 3.67 |
| 23327 | 169.896 | 0.321 | 12.812 | 0.082 | 2.00 |
| 23328 | 33.225 | 0.063 | 9.305 | 0.059 | HIGH |
| 23329 | 67.965 | 0.128 | 6.108 | 0.039 | 6.60 |
| 23330 | 53.154 | 0.100 | 14.797 | 0.094 | 7.59 |
| 23331 | 19.472 | 0.037 | 9.413 | 0.060 | HIGH |
| 23332 | 41.567 | 0.078 | 4.034 | 0.026 | HIGH |
| 23333 | 97.670 | 0.184 | 9.334 | 0.060 | 4.22 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23334 | 98.313 | 0.185 | 27.795 | 0.177 | 3.27 |
| 23338 | 104.272 | 0.197 | 32.315 | 0.206 | 2.85 |
| 23339 | 41.936 | 0.079 | 11.294 | 0.072 | HIGH |
| 23340 | 58.154 | 0.110 | 6.927 | 0.044 | 7.77 |
| 23341 | 42.782 | 0.081 | 15.319 | 0.098 | 9.22 |
| 23342 | 2.203 | 0.004 | 7.706 | 0.049 | HIGH |
| 23343 | 6.022 | 0.011 | 6.202 | 0.040 | HIGH |
| 23344 | 30.459 | 0.057 | 12.849 | 0.082 | HIGH |
| 23345 | 78.487 | 0.148 | 30.446 | 0.194 | 3.88 |
| 23350 | 27.052 | 0.051 | 34.981 | 0.223 | 7.09 |
| 23351 | 38.532 | 0.073 | 13.581 | 0.087 | HIGH |
| 23352 | 45.932 | 0.087 | 9.822 | 0.063 | 9.58 |
| 23353 | 30.639 | 0.058 | 11.433 | 0.073 | HIGH |
| 23354 | -26.281 | 0.050 | 7.325 | 0.047 | HIGH |
| 23355 | -9.593 | 0.018 | 7.139 | 0.046 | HIGH |
| 23356 | 11.372 | 0.021 | 5.476 | 0.035 | HIGH |
| 23357 | 18.976 | 0.036 | 27.902 | 0.178 | HIGH |
| 23363 | 29.237 | 0.055 | 28.512 | 0.182 | 8.44 |
| 23364 | 29.142 | 0.055 | 4.957 | 0.032 | HIGH |
| 23365 | 37.370 | 0.071 | 8.881 | 0.057 | HIGH |
| 23366 | 23.913 | 0.045 | 7.986 | 0.051 | HIGH |
| 23367 | -44.856 | 0.085 | 15.213 | 0.097 | 8.85 |
| 23368 | -6.971 | 0.013 | 7.645 | 0.049 | HIGH |
| 23369 | 13.500 | 0.025 | 2.870 | 0.018 | HIGH |
| 23370 | 25.598 | 0.048 | 7.284 | 0.047 | HIGH |
| 23371 | 1.335 | 0.003 | 28.788 | 0.184 | HIGH |
| 23376 | 55.037 | 0.104 | 25.745 | 0.164 | 5.84 |
| 23377 | 25.748 | 0.049 | 6.955 | 0.044 | HIGH |
| 23378 | 27.455 | 0.052 | 4.516 | 0.029 | HIGH |
| 23379 | 37.485 | 0.071 | 5.226 | 0.033 | HIGH |
| 23380 | 26.306 | 0.050 | 4.883 | 0.031 | HIGH |
| 23382 | 9.777 | 0.018 | 14.353 | 0.092 | HIGH |
| 23383 | 18.259 | 0.034 | 1.300 | 0.008 | HIGH |
| 23384 | 28.402 | 0.054 | 1.071 | 0.007 | HIGH |
| 23385 | 24.992 | 0.047 | 2.410 | 0.015 | HIGH |
| 23386 | 61.435 | 0.116 | 19.112 | 0.122 | 6.09 |
| 23390 | 51.588 | 0.097 | 16.332 | 0.104 | 7.59 |
| 23391 | 37.417 | 0.071 | 2.201 | 0.014 | HIGH |
| 23392 | 28.547 | 0.054 | 1.988 | 0.013 | HIGH |
| 23393 | 33.530 | 0.063 | 2.019 | 0.013 | HIGH |
| 23394 | 45.707 | 0.086 | 1.532 | 0.010 | HIGH |
| 23395 | 42.277 | 0.080 | 1.352 | 0.009 | HIGH |
| 23397 | 224.891 | 0.424 | 26.990 | 0.172 | 1.13 |
| 23398 | 157.696 | 0.298 | 1.954 | 0.012 | 2.36 |
| 23399 | 113.087 | 0.213 | 2.785 | 0.018 | 3.67 |

12.5.5

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23400 | 83.255 | 0.157 | 4.296 | 0.027 | 5.29 |
| 23401 | 41.777 | 0.079 | 4.762 | 0.030 | HIGH |
| 23402 | -28.820 | 0.054 | 4.626 | 0.030 | HIGH |
| 23403 | -132.300 | 0.250 | 14.411 | 0.092 | 2.77 |
| 23406 | 149.703 | 0.282 | 15.960 | 0.102 | 2.32 |
| 23407 | 157.312 | 0.297 | 9.550 | 0.061 | 2.29 |
| 23408 | 136.950 | 0.258 | 3.356 | 0.021 | 2.85 |
| 23409 | 116.087 | 0.219 | 7.652 | 0.049 | 3.46 |
| 23410 | 91.766 | 0.173 | 9.086 | 0.058 | 4.56 |
| 23411 | 35.937 | 0.068 | 9.052 | 0.058 | HIGH |
| 23412 | 16.174 | 0.031 | 8.553 | 0.055 | HIGH |
| 23413 | -5.285 | 0.010 | 31.910 | 0.204 | HIGH |
| 23415 | 141.057 | 0.266 | 10.564 | 0.067 | 2.64 |
| 23416 | 146.916 | 0.277 | 10.251 | 0.065 | 2.50 |
| 23417 | 134.893 | 0.255 | 9.335 | 0.060 | 2.82 |
| 23418 | 127.311 | 0.240 | 10.732 | 0.069 | 3.01 |
| 23419 | 79.475 | 0.150 | 11.197 | 0.072 | 5.26 |
| 23420 | -4.666 | 0.009 | 14.098 | 0.090 | HIGH |
| 23421 | -60.055 | 0.113 | 3.793 | 0.024 | 7.71 |
| 23424 | 133.661 | 0.252 | 15.586 | 0.100 | 2.71 |
| 23425 | 152.051 | 0.287 | 11.464 | 0.073 | 2.36 |
| 23426 | 176.158 | 0.332 | 16.778 | 0.107 | 1.84 |
| 23432 | 125.056 | 0.236 | 27.497 | 0.176 | 2.53 |
| 23433 | 124.288 | 0.235 | 32.545 | 0.208 | 2.35 |
| 23440 | 116.378 | 0.220 | 57.142 | 0.365 | 1.56 |
| 23450 | 111.347 | 0.210 | 76.763 | 0.490 | 1.01 |
| 23455 | 30.535 | 0.058 | 37.125 | 0.237 | 6.24 |
| 23456 | 156.115 | 0.295 | 18.143 | 0.116 | 2.15 |
| 23457 | 117.341 | 0.221 | 24.675 | 0.158 | 2.83 |
| 23463 | 76.097 | 0.144 | 17.565 | 0.112 | 5.05 |
| 23464 | 112.645 | 0.213 | 14.857 | 0.095 | 3.37 |
| 23465 | 76.763 | 0.145 | 15.032 | 0.096 | 5.20 |
| 23467 | -22.358 | 0.042 | 32.879 | 0.210 | 8.32 |
| 23470 | 107.320 | 0.202 | 18.002 | 0.115 | 3.44 |
| 23471 | 96.017 | 0.181 | 17.227 | 0.110 | 3.95 |
| 23472 | 79.916 | 0.151 | 10.110 | 0.065 | 5.29 |
| 23473 | 87.928 | 0.166 | 14.587 | 0.093 | 4.51 |
| 23474 | 5.748 | 0.011 | 27.341 | 0.175 | HIGH |
| 23475 | 49.005 | 0.092 | 12.832 | 0.082 | 8.52 |
| 23476 | 78.213 | 0.148 | 13.501 | 0.086 | 5.20 |
| 23477 | 78.383 | 0.148 | 13.391 | 0.086 | 5.20 |
| 23478 | 71.074 | 0.134 | 6.601 | 0.042 | 6.25 |
| 23479 | 80.474 | 0.152 | 21.367 | 0.136 | 4.48 |
| 23480 | 59.104 | 0.112 | 17.776 | 0.114 | 6.48 |
| 23481 | 75.489 | 0.142 | 11.411 | 0.073 | 5.55 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23482 | 73.867 | 0.139 | 10.930 | 0.070 | 5.72 |
| 23483 | 65.750 | 0.124 | 8.222 | 0.053 | 6.70 |
| 23484 | 74.828 | 0.141 | 19.696 | 0.126 | 4.96 |
| 23485 | 71.547 | 0.135 | 8.726 | 0.056 | 6.07 |
| 23486 | 74.599 | 0.141 | 7.037 | 0.045 | 5.89 |
| 23487 | 64.701 | 0.122 | 6.925 | 0.044 | 6.92 |
| 23488 | 71.621 | 0.135 | 13.934 | 0.089 | 5.68 |
| 23489 | 68.584 | 0.129 | 3.766 | 0.024 | 6.64 |
| 23490 | 65.225 | 0.123 | 3.734 | 0.024 | 7.03 |
| 23491 | 70.354 | 0.133 | 8.215 | 0.052 | 6.22 |
| 23492 | 59.735 | 0.113 | 1.944 | 0.012 | 7.84 |
| 23493 | 69.152 | 0.130 | 5.203 | 0.033 | 6.52 |
| 23494 | 63.561 | 0.120 | 4.068 | 0.026 | 7.22 |
| 23499 | 5.595 | 0.011 | 6.761 | 0.043 | HIGH |
| 23500 | -9.395 | 0.018 | 3.902 | 0.025 | HIGH |
| 23501 | -26.048 | 0.049 | 4.469 | 0.029 | HIGH |
| 23502 | -39.227 | 0.074 | 3.753 | 0.024 | HIGH |
| 23503 | -50.291 | 0.095 | 1.922 | 0.012 | 9.49 |
| 23504 | -62.350 | 0.118 | 1.535 | 0.010 | 7.48 |
| 23505 | -76.409 | 0.144 | 1.690 | 0.011 | 5.92 |
| 23506 | -90.413 | 0.171 | 1.570 | 0.010 | 4.85 |
| 23509 | 18.606 | 0.035 | 9.573 | 0.061 | HIGH |
| 23510 | -21.459 | 0.040 | 8.863 | 0.057 | HIGH |
| 23511 | -37.785 | 0.071 | 8.923 | 0.057 | HIGH |
| 23512 | -45.328 | 0.086 | 6.440 | 0.041 | HIGH |
| 23513 | -53.691 | 0.101 | 3.272 | 0.021 | 8.76 |
| 23514 | -63.840 | 0.120 | 4.565 | 0.029 | 7.16 |
| 23515 | -67.384 | 0.127 | 4.644 | 0.030 | 6.74 |
| 23518 | -144.574 | 0.273 | 6.238 | 0.040 | 2.62 |
| 23519 | -72.093 | 0.136 | 15.749 | 0.101 | 5.49 |
| 23520 | -47.449 | 0.090 | 11.553 | 0.074 | 9.00 |
| 23521 | -59.055 | 0.111 | 10.764 | 0.069 | 7.29 |
| 23522 | -59.135 | 0.112 | 7.789 | 0.050 | 7.56 |
| 23523 | -60.988 | 0.115 | 9.018 | 0.058 | 7.21 |
| 23524 | -57.504 | 0.108 | 9.303 | 0.059 | 7.65 |
| 23530 | -103.386 | 0.195 | 16.747 | 0.107 | 3.65 |
| 23531 | -74.418 | 0.140 | 11.681 | 0.075 | 5.62 |
| 23532 | -58.201 | 0.110 | 15.345 | 0.098 | 6.88 |
| 23539 | -82.042 | 0.155 | 29.501 | 0.188 | 3.79 |
| 23540 | -50.624 | 0.096 | 28.102 | 0.179 | 5.90 |
| 23550 | -5.041 | 0.010 | 54.137 | 0.346 | 5.05 |
| 23553 | -59.872 | 0.113 | 19.671 | 0.126 | 6.17 |
| 23554 | -121.595 | 0.229 | 33.549 | 0.214 | 2.37 |
| 23559 | 69.932 | 0.132 | 64.163 | 0.410 | 1.93 |
| 23561 | -96.032 | 0.181 | 14.782 | 0.094 | 4.07 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23562 | -112.624 | 0.212 | 13.771 | 0.088 | 3.41 |
| 23563 | -170.709 | 0.322 | 16.175 | 0.103 | 1.93 |
| 23568 | -16.211 | 0.031 | 10.593 | 0.068 | HIGH |
| 23569 | -86.540 | 0.163 | 8.639 | 0.055 | 4.90 |
| 23570 | -142.512 | 0.269 | 15.619 | 0.100 | 2.49 |
| 23571 | -190.294 | 0.359 | 16.068 | 0.103 | 1.65 |
| 23574 | -60.338 | 0.114 | 35.301 | 0.225 | 4.33 |
| 23575 | -65.681 | 0.124 | 13.931 | 0.089 | 6.22 |
| 23576 | -97.160 | 0.183 | 6.627 | 0.042 | 4.34 |
| 23577 | -121.604 | 0.229 | 12.379 | 0.079 | 3.15 |
| 23578 | -129.270 | 0.244 | 12.533 | 0.080 | 2.91 |
| 23579 | -105.249 | 0.199 | 13.792 | 0.088 | 3.70 |
| 23580 | -90.041 | 0.170 | 28.353 | 0.181 | 3.54 |
| 23581 | -81.743 | 0.154 | 11.362 | 0.073 | 5.08 |
| 23582 | -95.578 | 0.180 | 8.005 | 0.051 | 4.38 |
| 23583 | -116.547 | 0.220 | 10.408 | 0.066 | 3.37 |
| 23584 | -128.687 | 0.243 | 11.139 | 0.071 | 2.96 |
| 23585 | -109.274 | 0.206 | 15.850 | 0.101 | 3.46 |
| 23586 | -79.389 | 0.150 | 5.960 | 0.038 | 5.53 |
| 23587 | -103.376 | 0.195 | 4.394 | 0.028 | 4.08 |
| 23588 | -123.841 | 0.234 | 6.449 | 0.041 | 3.21 |
| 23589 | -116.944 | 0.221 | 6.668 | 0.043 | 3.45 |
| 23590 | -79.865 | 0.151 | 3.425 | 0.022 | 5.56 |
| 23591 | -123.176 | 0.232 | 5.822 | 0.037 | 3.25 |
| 23592 | -113.984 | 0.215 | 5.562 | 0.036 | 3.59 |
| 23594 | -189.062 | 0.357 | 28.622 | 0.183 | 1.45 |
| 32201 | -201.943 | 0.381 | 2.264 | 0.014 | 1.62 |
| 32202 | 199.915 | 0.377 | 6.071 | 0.039 | 1.63 |
| 32204 | -205.862 | 0.388 | 7.645 | 0.049 | 1.54 |
| 32205 | -131.513 | 0.248 | 7.430 | 0.047 | 2.95 |
| 32206 | 90.532 | 0.171 | 7.416 | 0.047 | 4.69 |
| 32207 | -300.214 | 0.566 | 27.819 | 0.178 | 0.63 |
| 32208 | 11.925 | 0.022 | 27.870 | 0.179 | HIGH |
| 32215 | -339.336 | 0.640 | 5.294 | 0.034 | 0.56 |
| 32216 | -208.175 | 0.393 | 2.204 | 0.014 | 1.54 |
| 32222 | -409.427 | 0.773 | 27.811 | 0.178 | 0.22 |
| 32223 | -340.706 | 0.643 | 39.558 | 0.253 | 0.36 |
| 32224 | -264.373 | 0.499 | 10.922 | 0.070 | 0.97 |
| 32225 | -302.883 | 0.571 | 2.432 | 0.016 | 0.75 |
| 32226 | -207.361 | 0.391 | 3.814 | 0.024 | 1.55 |
| 32227 | -187.306 | 0.353 | 16.041 | 0.102 | 1.69 |
| 32228 | -129.382 | 0.244 | 11.353 | 0.072 | 2.93 |
| 32229 | -63.844 | 0.120 | 7.206 | 0.046 | 7.03 |
| 32230 | 22.881 | 0.043 | 19.273 | 0.123 | HIGH |
| 32231 | -189.864 | 0.358 | 23.612 | 0.151 | 1.53 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32232 | -289.500 | 0.546 | 4.673 | 0.030 | 0.82 |
| 32233 | -235.456 | 0.444 | 154.903 | 0.989 | -0.30 |
| 32234 | -237.726 | 0.449 | 5.029 | 0.032 | 1.22 |
| 32235 | -184.686 | 0.348 | 5.059 | 0.032 | 1.85 |
| 32236 | -183.016 | 0.345 | 1.835 | 0.012 | 1.89 |
| 32237 | -168.621 | 0.318 | 2.416 | 0.015 | 2.14 |
| 32238 | -136.708 | 0.258 | 16.599 | 0.106 | 2.60 |
| 32239 | -77.798 | 0.147 | 11.792 | 0.075 | 5.34 |
| 32240 | -19.337 | 0.036 | 14.315 | 0.091 | HIGH |
| 32241 | -93.972 | 0.177 | 17.822 | 0.114 | 4.01 |
| 32242 | -134.801 | 0.254 | 21.232 | 0.136 | 2.51 |
| 32243 | -204.319 | 0.386 | 36.544 | 0.233 | 1.16 |
| 32244 | -182.370 | 0.344 | 41.800 | 0.267 | 1.26 |
| 32245 | -131.158 | 0.247 | 13.858 | 0.088 | 2.82 |
| 32246 | -139.403 | 0.263 | 0.329 | 0.002 | 2.80 |
| 32247 | -147.040 | 0.277 | 1.161 | 0.007 | 2.60 |
| 32248 | -146.619 | 0.277 | 0.660 | 0.004 | 2.61 |
| 32249 | -112.401 | 0.212 | 8.743 | 0.056 | 3.58 |
| 32250 | -75.874 | 0.143 | 8.368 | 0.053 | 5.71 |
| 32251 | -40.208 | 0.076 | 4.665 | 0.030 | HIGH |
| 32252 | -51.260 | 0.097 | 10.255 | 0.065 | 8.51 |
| 32253 | -71.346 | 0.135 | 13.613 | 0.087 | 5.73 |
| 32254 | -88.479 | 0.167 | 28.647 | 0.183 | 3.58 |
| 32255 | -153.525 | 0.290 | 7.320 | 0.047 | 2.40 |
| 32256 | -163.664 | 0.309 | 18.277 | 0.117 | 2.01 |
| 32257 | -125.201 | 0.236 | 7.903 | 0.050 | 3.14 |
| 32258 | -110.882 | 0.209 | 6.890 | 0.044 | 3.69 |
| 32259 | -69.186 | 0.131 | 9.846 | 0.063 | 6.22 |
| 32260 | -108.913 | 0.205 | 2.888 | 0.018 | 3.84 |
| 32261 | -82.606 | 0.156 | 8.809 | 0.056 | 5.16 |
| 32262 | -63.597 | 0.120 | 3.186 | 0.020 | 7.26 |
| 32263 | -44.412 | 0.084 | 2.494 | 0.016 | HIGH |
| 32264 | -37.507 | 0.071 | 2.941 | 0.019 | HIGH |
| 32265 | -49.526 | 0.093 | 5.131 | 0.033 | 9.42 |
| 32266 | -57.379 | 0.108 | 7.708 | 0.049 | 7.82 |
| 32267 | -86.566 | 0.163 | 12.013 | 0.077 | 4.73 |
| 32268 | -106.839 | 0.202 | 9.208 | 0.059 | 3.79 |
| 32269 | -115.916 | 0.219 | 8.932 | 0.057 | 3.44 |
| 32270 | 35.922 | 0.068 | 14.831 | 0.095 | HIGH |
| 32271 | 16.781 | 0.032 | 4.105 | 0.026 | HIGH |
| 32272 | 14.900 | 0.028 | 3.509 | 0.022 | HIGH |
| 32273 | -20.770 | 0.039 | 1.807 | 0.012 | HIGH |
| 32274 | -68.036 | 0.128 | 2.380 | 0.015 | 6.75 |
| 32275 | 195.921 | 0.370 | 5.380 | 0.034 | 1.69 |
| 32278 | 21.298 | 0.040 | 25.328 | 0.162 | HIGH |

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5.5.24

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32279 | -51.070 | 0.096 | 3.907 | 0.025 | 9.21 |
| 32280 | 7.349 | 0.014 | 0.078 | 0.000 | HIGH |
| 32281 | -142.338 | 0.269 | 2.477 | 0.016 | 2.71 |
| 32282 | -114.659 | 0.216 | 3.070 | 0.020 | 3.60 |
| 32283 | -74.614 | 0.141 | 22.539 | 0.144 | 4.73 |
| 32286 | -112.692 | 0.213 | 9.717 | 0.062 | 3.54 |
| 32287 | -103.512 | 0.195 | 1.484 | 0.009 | 4.11 |
| 32288 | -96.959 | 0.183 | 1.264 | 0.008 | 4.46 |
| 32289 | -118.639 | 0.224 | 1.435 | 0.009 | 3.46 |
| 32290 | -167.978 | 0.317 | 2.486 | 0.016 | 2.15 |
| 32293 | -75.608 | 0.143 | 14.274 | 0.091 | 5.34 |
| 32294 | -122.719 | 0.232 | 3.244 | 0.021 | 3.30 |
| 32295 | -5.041 | 0.010 | 0.259 | 0.002 | HIGH |
| 32296 | -159.941 | 0.302 | 4.448 | 0.028 | 2.29 |
| 32297 | -230.937 | 0.436 | 4.821 | 0.031 | 1.28 |
| 32300 | -77.676 | 0.147 | 20.527 | 0.131 | 4.71 |
| 32301 | -100.448 | 0.190 | 5.033 | 0.032 | 4.21 |
| 32302 | -129.692 | 0.245 | 5.002 | 0.032 | 3.05 |
| 32303 | -188.360 | 0.355 | 15.206 | 0.097 | 1.69 |
| 32304 | -251.609 | 0.475 | 23.716 | 0.151 | 0.96 |
| 32308 | -85.212 | 0.161 | 8.910 | 0.057 | 4.97 |
| 32309 | -107.494 | 0.203 | 9.002 | 0.057 | 3.77 |
| 32310 | -142.892 | 0.270 | 9.429 | 0.060 | 2.61 |
| 32311 | -200.928 | 0.379 | 58.842 | 0.376 | 0.79 |
| 32312 | -361.125 | 0.681 | 28.496 | 0.182 | 0.37 |
| 32316 | -55.894 | 0.105 | 12.784 | 0.082 | 7.48 |
| 32317 | -65.194 | 0.123 | 12.731 | 0.081 | 6.39 |
| 32318 | -53.630 | 0.101 | 22.985 | 0.147 | 6.35 |
| 32319 | 21.423 | 0.040 | 48.004 | 0.307 | 5.00 |
| 32320 | -330.950 | 0.624 | 19.462 | 0.124 | 0.54 |
| 32323 | -12.267 | 0.023 | 21.504 | 0.137 | HIGH |
| 32324 | -2.111 | 0.004 | 11.350 | 0.072 | HIGH |
| 32325 | 18.192 | 0.034 | 28.332 | 0.181 | HIGH |
| 32326 | 58.542 | 0.110 | 57.568 | 0.368 | 2.52 |
| 32327 | 215.431 | 0.406 | 10.489 | 0.067 | 1.41 |
| 32329 | 62.692 | 0.118 | 21.465 | 0.137 | 5.70 |
| 32330 | 68.738 | 0.130 | 16.810 | 0.107 | 5.67 |
| 32331 | 86.006 | 0.162 | 19.054 | 0.122 | 4.34 |
| 32332 | 154.849 | 0.292 | 76.033 | 0.486 | 0.74 |
| 32333 | 188.206 | 0.355 | 134.522 | 0.859 | -0.11 |
| 32334 | 105.975 | 0.200 | 29.500 | 0.188 | 2.94 |
| 32335 | 135.044 | 0.255 | 49.483 | 0.316 | 1.58. |
| 32336 | 80.641 | 0.152 | 1.607 | 0.010 | 5.56 |
| 32337 | 190.837 | 0.360 | 80.149 | 0.512 | 0.49 |
| 32338 | 108.112 | 0.204 | 17.819 | 0.114 | 3.42 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32339 | 127.215 | 0.240 | 18.055 | 0.115 | 2.80 |
| 32340 | 157.056 | 0.296 | 25.013 | 0.160 | 1.97 |
| 32341 | 128.789 | 0.243 | 4.346 | 0.028 | 3.08 |
| 32342 | 147.739 | 0.279 | 13.252 | 0.085 | 2.42 |
| 32343 | 99.280 | 0.187 | 10.378 | 0.066 | 4.10 |
| 32346 | 133.696 | 0.252 | 20.290 | 0.130 | 2.57 |
| 32347 | -119.733 | 0.226 | 22.331 | 0.143 | 2.86 |
| 32348 | -99.591 | 0.188 | 159.666 | 1.020 | -0.18 |
| 32349 | -76.260 | 0.144 | 36.710 | 0.234 | 3.49 |
| 32350 | -89.776 | 0.169 | 24.964 | 0.159 | 3.77 |
| 32351 | -69.068 | 0.130 | 2.979 | 0.019 | 6.62 |
| 32353 | -769.803 | 1.452 | 15.779 | 0.101 | -0.32 |
| 32354 | -593.736 | 1.120 | 13.482 | 0.086 | -0.12 |
| 32355 | -234.282 | 0.442 | 55.821 | 0.356 | 0.65 |
| 32356 | -164.154 | 0.310 | 25.216 | 0.161 | 1.85 |
| 32357 | -104.705 | 0.198 | 21.413 | 0.137 | 3.38 |
| 32358 | -80.099 | 0.151 | 18.263 | 0.117 | 4.73 |
| 32361 | -592.970 | 1.119 | 8.214 | 0.052 | -0.11 |
| 32362 | -198.390 | 0.374 | 58.171 | 0.371 | 0.81 |
| 32363 | -157.711 | 0.298 | 32.027 | 0.205 | 1.78 |
| 32364 | -140.494 | 0.265 | 7.399 | 0.047 | 2.71 |
| 32365 | -107.137 | 0.202 | 28.155 | 0.180 | 2.97 |
| 32368 | -44.941 | 0.085 | 43.512 | 0.278 | 4.23 |
| 32369 | -193.085 | 0.364 | 52.891 | 0.338 | 0.95 |
| 32370 | -119.573 | 0.226 | 29.665 | 0.189 | 2.57 |
| 32371 | -99.685 | 0.188 | 14.175 | 0.091 | 3.93 |
| 32372 | -88.163 | 0.166 | 32.655 | 0.209 | 3.33 |
| 32375 | 73.128 | 0.138 | 32.774 | 0.209 | 3.93 |
| 32376 | 9.007 | 0.017 | 25.997 | 0.166 | HIGH |
| 32377 | -49.989 | 0.094 | 22.508 | 0.144 | 6.82 |
| 32378 | -39.358 | 0.074 | 16.738 | 0.107 | 9.61 |
| 32379 | -24.226 | 0.046 | 18.218 | 0.116 | HIGH |
| 32383 | 172.285 | 0.325 | 12.172 | 0.078 | 1.97 |
| 32384 | 115.910 | 0.219 | 10.851 | 0.069 | 3.38 |
| 32385 | 56.993 | 0.108 | 13.647 | 0.087 | 7.23 |
| 32386 | 21.244 | 0.040 | 13.509 | 0.086 | HIGH |
| 32387 | 15.838 | 0.030 | 14.009 | 0.089 | HIGH |
| 32390 | 183.604 | 0.346 | 5.379 | 0.034 | 1.86 |
| 32391 | 154.926 | 0.292 | 1.388 | 0.009 | 2.42 |
| 32392 | 110.242 | 0.208 | 9.925 | 0.063 | 3.63 |
| 32393 | 78.950 | 0.149 | 7.552 | 0.048 | 5.50 |
| 32394 | 60.439 | 0.114 | 7.505 | 0.048 | 7.41 |
| 32396 | 322.943 | 0.609 | 6.286 | 0.040 | 0.63 |
| 32397 | 173.476 | 0.327 | 1.489 | 0.010 | 2.05 |
| 32368 | 147.878 | 0.279 | 1.397 | 0.009 | 2.58 |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32399 | 103.100 | 0.195 | 2.420 | 0.015 | 4.12 |
| 32400 | 81.028 | 0.153 | 5.668 | 0.036 | 5.41 |
| 32401 | 127.402 | 0.240 | 13.858 | 0.088 | 2.93 |
| 32402 | 162.693 | 0.307 | 3.519 | 0.022 | 2.24 |
| 32403 | 158.858 | 0.300 | 0.343 | 0.002 | 2.34 |
| 32404 | 169.811 | 0.320 | 2.192 | 0.014 | 2.12 |
| 32405 | 56.051 | 0.106 | 56.696 | 0.362 | 2.64 |
| 32406 | 28.450 | 0.054 | 8.266 | 0.053 | HIGH |
| 32407 | 97.664 | 0.184 | 3.221 | 0.021 | 4.39 |
| 32408 | 167.865 | 0.317 | 1.711 | 0.011 | 2.15 |
| 32409 | 174.529 | 0.329 | 14.039 | 0.090 | 1.91 |
| 32410 | 45.545 | 0.086 | 13.708 | 0.088 | 9.00 |
| 32411 | 70.976 | 0.134 | 4.732 | 0.030 | 6.35 |
| 32412 | 33.306 | 0.063 | 7.904 | 0.050 | HIGH |
| 32413 | 91.030 | 0.172 | 8.098 | 0.052 | 4.64 |
| 32414 | 74.676 | 0.141 | 15.345 | 0.098 | 5.33 |
| 32415 | 60.486 | 0.114 | 24.677 | 0.158 | 5.51 |
| 32425 | -224.256 | 0.423 | 18.427 | 0.118 | 1.24 |
| 32426 | 173.624 | 0.328 | 4.251 | 0.027 | 2.04 |
| 32427 | -202.186 | 0.381 | 4.564 | 0.029 | 1.61 |
| 32443 | -174.330 | 0.329 | 2.178 | 0.014 | 2.04 |
| 32444 | -94.299 | 0.178 | 4.516 | 0.029 | 4.56 |
| 32445 | 153.635 | 0.290 | 4.584 | 0.029 | 2.43 |
| 32446 | -93.873 | 0.177 | 6.818 | 0.044 | 4.52 |
| 32447 | 58.038 | 0.110 | 34.541 | 0.221 | 4.54 |
| 32463 | 66.808 | 0.126 | 8.884 | 0.057 | 6.54 |
| 32464 | -318.559 | 0.601 | 2.893 | 0.018 | 0.66 |
| 32465 | 117.100 | 0.221 | 17.912 | 0.114 | 3.11 |
| 33301 | 265.290 | 0.501 | 9.681 | 0.062 | 0.97 |
| 33302 | -67.260 | 0.127 | 7.618 | 0.049 | 6.58 |
| 33303 | -11.368 | 0.021 | 11.328 | 0.072 | HIGH |
| 33304 | 187.583 | 0.354 | 3.283 | 0.021 | 1.82 |
| 33305 | 606.668 | 1.145 | 6.563 | 0.042 | -0.13 |
| 33306 | -216.878 | 0.409 | 9.007 | 0.058 | 1.40 |
| 33307 | 585.609 | 1.105 | 7.913 | 0.051 | -0.10 |
| 33308 | -208.221 | 0.393 | 10.691 | 0.068 | 1.49 |
| 33313 | 225.048 | 0.425 | 9.672 | 0.062 | 1.31 |
| 33314 | 242.428 | 0.457 | 7.543 | 0.048 | 1.16 |
| 33319 | 596.829 | 1.126 | 5.523 | 0.035 | -0.11 |
| 33320 | 433.439 | 0.818 | 10.605 | 0.068 | 0.21 |
| 33321 | 268.169 | 0.506 | 13.515 | 0.086 | 0.92 |
| 33322 | 245.850 | 0.464 | 5.736 | 0.037 | 1.14 |
| 33323 | 151.813 | 0.286 | 6.737 | 0.043 | 2.44 |
| 33324 | 303.363 | 0.572 | 8.050 | 0.051 | 0.73 |
| 33327 | 285.137 | 0.538 | 6.764 | 0.043 | 0.84 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33328 | 313.709 | 0.592 | 6.959 | 0.044 | 0.68 |
| 33329 | 524.581 | 0.990 | 6.379 | 0.041 | 0.01 |
| 33330 | 526.481 | 0.993 | 15.917 | 0.102 | -0.01 |
| 33331 | 248.793 | 0.469 | 13.178 | 0.084 | 1.07 |
| 33332 | 234.861 | 0.443 | 5.529 | 0.035 | 1.24 |
| 33333 | 230.496 | 0.435 | 8.919 | 0.057 | 1.26 |
| 33334 | 290.253 | 0.548 | 22.785 | 0.145 | 0.72 |
| 33338 | 425.779 | 0.803 | 20.191 | 0.129 | 0.20 |
| 33339 | 454.750 | 0.858 | 10.029 | 0.064 | 0.15 |
| 33340 | 430.524 | 0.812 | 6.348 | 0.041 | 0.23 |
| 33341 | 487.740 | 0.920 | 15.054 | 0.096 | 0.07 |
| 33342 | 212.554 | 0.401 | 9.339 | 0.060 | 1.45 |
| 33343 | 189.502 | 0.358 | 7.573 | 0.048 | 1.76 |
| 33344 | 179.272 | 0.338 | 11.220 | 0.072 | 1.87 |
| 33345 | 195.738 | 0.369 | 27.220 | 0.174 | 1.40 |
| 33350 | 422.898 | 0.798 | 28.374 | 0.181 | 0.18 |
| 33351 | 330.104 | 0.623 | 12.735 | 0.081 | 0.57 |
| 33352 | 333.361 | 0.629 | 8.910 | 0.057 | 0.57 |
| 33353 | 409.085 | 0.772 | 9.323 | 0.060 | 0.28 |
| 33354 | 172.508 | 0.325 | 5.657 | 0.036 | 2.04 |
| 33355 | 148.748 | 0.281 | 6.553 | 0.042 | 2.51 |
| 33356 | 132.570 | 0.250 | 5.084 | 0.032 | 2.96 |
| 33357 | 109.487 | 0.207 | 22.777 | 0.145 | 3.15 |
| 33363 | 212.146 | 0.400 | 26.024 | 0.166 | 1.25 |
| 33364 | 259.068 | 0.489 | 6.550 | 0.042 | 1.03 |
| 33365 | 266.026 | 0.502 | 8.727 | 0.056 | 0.97 |
| 33366 | 306.895 | 0.579 | 8.412 | 0.054 | 0.71 |
| 33367 | 135.084 | 0.255 | 3.340 | 0.021 | 2.91 |
| 33368 | 114.118 | 0.215 | 3.647 | 0.023 | 3.61 |
| 33369 | 102.658 | 0.194 | 2.638 | 0.017 | 4.14 |
| 33370 | 89.297 | 0.168 | 6.871 | 0.044 | 4.79 |
| 33371 | 59.903 | 0.113 | 20.456 | 0.131 | 6.07 |
| 33376 | 50.882 | 0.096 | 23.565 | 0.150 | 6.56 |
| 33377 | 196.869 | 0.371 | 9.370 | 0.060 | 1.64 |
| 33378 | 226.200 | 0.427 | 1.976 | 0.013 | 1.34 |
| 33379 | 227.013 | 0.428 | 10.478 | 0.067 | 1.29 |
| 33380 | 184.391 | 0.348 | 27.595 | 0.176 | 1.53 |
| 33381 | 102.370 | 0.193 | 3.051 | 0.019 | 4.15 |
| 33382 | 79.480 | 0.150 | 1.076 | 0.007 | 5.66 |
| 33383 | 69.048 | 0.130 | 0.979 | 0.006 | 6.67 |
| 33384 | 64.048 | 0.121 | 1.195 | 0.008 | 7.26 |
| 33385 | 51.751 | 0.098 | 2.429 | 0.016 | 9.17 |
| 33386 | 77.583 | 0.146 | 12.262 | 0.078 | 5.33 |
| 33390 | 129.761 | 0.245 | 12.431 | 0.079 | 2.90 |
| 33391 | 88.295 | 0.167 | 4.070 | 0.026 | 4.94 |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33392 | 154.977 | 0.292 | 1.830 | 0.012 | 2.42 |
| 33393 | 172.747 | 0.326 | 4.251 | 0.027 | 2.05 |
| 33394 | 209.335 | 0.395 | 29.780 | 0.190 | 1.22 |
| 33396 | -41.892 | 0.079 | 0.672 | 0.004 | HIGH |
| 33397 | -17.502 | 0.033 | 1.211 | 0.008 | HIGH |
| 33398 | -2.855 | 0.005 | 0.575 | 0.004 | HIGH |
| 33399 | 8.391 | 0.016 | 1.810 | 0.012 | HIGH |
| 33400 | 16.949 | 0.032 | 2.864 | 0.018 | HIGH |
| 33401 | 18.135 | 0.034 | 3.411 | 0.022 | HIGH |
| 33402 | 27.777 | 0.052 | 2.481 | 0.016 | HIGH |
| 33403 | -3.874 | 0.007 | 6.403 | 0.041 | HIGH |
| 33406 | 18.118 | 0.034 | 3.402 | 0.022 | HIGH |
| 33407 | 32.454 | 0.061 | 0.439 | 0.003 | HIGH |
| 33408 | 44.148 | 0.083 | 2.453 | 0.016 | HIGH |
| 33409 | 60.531 | 0.114 | 5.224 | 0.033 | 7.56 |
| 33410 | 70.997 | 0.134 | 6.825 | 0.044 | 6.24 |
| 33411 | 75.633 | 0.143 | 6.930 | 0.044 | 5.80 |
| 33412 | 156.701 | 0.296 | 7.990 | 0.051 | 2.32 |
| 33413 | 257.344 | 0.486 | 21.578 | 0.138 | 0.94 |
| 33415 | 55.183 | 0.104 | 2.735 | 0.017 | 8.53 |
| 33416 | 67.294 | 0.127 | 2.531 | 0.016 | 6.83 |
| 33417 | 80.902 | 0.153 | 7.072 | 0.045 | 5.37 |
| 33418 | 104.161 | 0.197 | 8.737 | 0.056 | 3.93 |
| 33419 | 88.008 | 0.166 | 9.517 | 0.061 | 4.76 |
| 33420 | -25.987 | 0.049 | 12.188 | 0.078 | HIGH |
| 33421 | -126.900 | 0.239 | 6.184 | 0.040 | 3.12 |
| 33424 | 70.256 | 0.133 | 5.874 | 0.038 | 6.37 |
| 33425 | 89.914 | 0.170 | 9.611 | 0.061 | 4.64 |
| 33426 | 119.437 | 0.225 | 13.119 | 0.084 | 3.19 |
| 33432 | 68.050 | 0.128 | 11.830 | 0.076 | 6.18 |
| 33433 | 60.599 | 0.114 | 23.010 | 0.147 | 5.70 |
| 33440 | 65.298 | 0.123 | 36.817 | 0.235 | 3.94 |
| 33450 | 90.548 | 0.171 | 71.121 | 0.454 | 1.37 |
| 33455 | -51.848 | 0.098 | 24.407 | 0.156 | 6.33 |
| 33456 | -9.323 | 0.018 | 10.602 | 0.068 | HIGH |
| 33457 | 504.862 | 0.953 | 2.809 | 0.018 | 0.05 |
| 33463 | -446.523 | 0.842 | 12.879 | 0.082 | 0.17 |
| 33464 | -325.149 | 0.613 | 9.078 | 0.058 | 0.61 |
| 33465 | -479.266 | 0.904 | 14.547 | 0.093 | 0.09 |
| 33467 | -77.785 | 0.147 | 12.679 | 0.081 | 5.29 |
| 33470 | -594.268 | 1.121 | 13.856 | 0.088 | -0.12 |
| 33471 | -502.110 | 0.947 | 12.918 | 0.082 | 0.04 |
| 33472 | -477.686 | 0.901 | 10.818 | 0.069 | 0.10 |
| 33473 | -385.464 | 0.727 | 15.181 | 0.097 | 0.34 |
| 33474 | -163.256 | 0.308 | 13.314 | 0.085 | 2.11 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33475 | -279.633 | 0.528 | 13.520 | 0.086 | 0.85 |
| 33476 | -424.468 | 0.801 | 12.581 | 0.080 | 0.23 |
| 33477 | -470.860 | 0.888 | 11.661 | 0.074 | 0.11 |
| 33478 | -473.762 | 0.894 | 7.419 | 0.047 | 0.11 |
| 33479 | -438.216 | 0.827 | 24.444 | 0.156 | 0.16 |
| 33480 | -294.248 | 0.555 | 13.914 | 0.089 | 0.76 |
| 33481 | -404.282 | 0.763 | 13.743 | 0.088 | 0.29 |
| 33482 | -433.101 | 0.817 | 11.847 | 0.076 | 0.21 |
| 33483 | -439.677 | 0.830 | 5.978 | 0.038 | 0.20 |
| 33484 | -427.764 | 0.807 | 23.419 | 0.150 | 0.19 |
| 33485 | -342.825 | 0.647 | 15.728 | 0.100 | 0.50 |
| 33486 | -403.630 | 0.762 | 14.861 | 0.095 | 0.29 |
| 33487 | -404.067 | 0.762 | 3.516 | 0.022 | 0.31 |
| 33488 | -371.990 | 0.702 | 15.911 | 0.102 | 0.39 |
| 33489 | -293.712 | 0.554 | 23.615 | 0.151 | 0.69 |
| 33490 | -366.130 | 0.691 | 11.127 | 0.071 | 0.43 |
| 33491 | -273.316 | 0.516 | 1.484 | 0.009 | 0.94 |
| 33492 | -337.562 | 0.637 | 65.038 | 0.415 | 0.17 |
| 33499 | -178.215 | 0.336 | 5.754 | 0.037 | 1.95 |
| 33500 | 84.564 | 0.160 | 2.716 | 0.017 | 5.24 |
| 33501 | 171.921 | 0.324 | 3.413 | 0.022 | 2.07 |
| 33502 | 221.001 | 0.417 | 2.316 | 0.015 | 1.39 |
| 33503 | 254.026 | 0.479 | 2.183 | 0.014 | 1.08 |
| 33504 | 314.278 | 0.593 | 6.759 | 0.043 | 0.67 |
| 33505 | 433.206 | 0.817 | 36.436 | 0.233 | 0.12 |
| 33509 | 495.706 | 0.935 | 7.841 | 0.050 | 0.06 |
| 33510 | 340.577 | 0.643 | 6.536 | 0.042 | 0.55 |
| 33511 | 364.615 | 0.688 | 6.024 | 0.038 | 0.45 |
| 33512 | 361.353 | 0.682 | 5.263 | 0.034 | 0.46 |
| 33513 | 354.448 | 0.669 | 3.767 | 0.024 | 0.49 |
| 33514 | 353.660 | 0.667 | 7.246 | 0.046 | 0.49 |
| 33515 | 280.246 | 0.529 | 19.490 | 0.124 | 0.80 |
| 33518 | 231.400 | 0.437 | 9.010 | 0.058 | 1.26 |
| 33519 | 193.734 | 0.366 | 9.999 | 0.064 | 1.68 |
| 33520 | 383.263 | 0.723 | 9.181 | 0.059 | 0.37 |
| 33521 | 475.757 | 0.898 | 8.444 | 0.054 | 0.11 |
| 33522 | 429.132 | 0.810 | 7.729 | 0.049 | 0.23 |
| 33523 | 399.940 | 0.755 | 3.265 | 0.021 | 0.32 |
| 33524 | 338.608 | 0.639 | 3.600 | 0.023 | 0.56 |
| 33530 | 619.519 | 1.169 | 13.541 | 0.086 | -0.15 |
| 33531 | 474.449 | 0.895 | 11.185 | 0.071 | 0.10 |
| 33532 | 367.511 | 0.693 | 4.581 | 0.029 | 0.44 |
| 33539 | 406.981 | 0.768 | 23.049 | 0.147 | 0.25 |
| 33540 | 346.212 | 0.653 | 11.145 | 0.071 | 0.51 |
| 33550 | 262.864 | 0.496 | 40.775 | 0.260 | 0.69 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33553 | 152.510 | 0.288 | 17.513 | 0.112 | 2.23 |
| 33554 | -29.809 | 0.056 | 27.770 | 0.177 | 8.55 |
| 33559 | 158.746 | 0.300 | 105.437 | 0.673 | 0.25 |
| 33561 | -93.150 | 0.176 | 14.248 | 0.091 | 4.24 |
| 33562 | -14.967 | 0.028 | 10.112 | 0.065 | HIGH |
| 33563 | -112.046 | 0.211 | 13.180 | 0.084 | 3.45 |
| 33568 | -93.491 | 0.176 | 14.312 | 0.091 | 4.22 |
| 33569 | -105.786 | 0.200 | 10.542 | 0.067 | 3.80 |
| 33570 | -101.391 | 0.191 | 13.204 | 0.084 | 3.89 |
| 33571 | -117.613 | 0.222 | 13.957 | 0.089 | 3.23 |
| 33574 | -44.375 | 0.084 | 11.678 | 0.075 | 9.60 |
| 33575 | -93.378 | 0.176 | 21.655 | 0.138 | 3.82 |
| 33576 | -111.107 | 0.210 | 6.494 | 0.041 | 3.69 |
| 33577 | -100.871 | 0.190 | 11.469 | 0.073 | 3.98 |
| 33578 | -77.833 | 0.147 | 11.528 | 0.074 | 5.36 |
| 33579 | -48.545 | 0.092 | 11.794 | 0.075 | 8.76 |
| 33580 | -48.255 | 0.091 | 9.592 | 0.061 | 9.14 |
| 33581 | -92.146 | 0.174 | 20.647 | 0.132 | 3.93 |
| 33582 | -98.814 | 0.186 | 6.849 | 0.044 | 4.25 |
| 33583 | -82.642 | 0.156 | 11.170 | 0.071 | 5.03 |
| 33584 | -69.268 | 0.131 | 11.440 | 0.073 | 6.09 |
| 33585 | -48.830 | 0.092 | 9.128 | 0.058 | 9.10 |
| 33586 | -75.391 | 0.142 | 15.125 | 0.097 | 5.29 |
| 33587 | -76.142 | 0.144 | 7.756 | 0.050 | 5.72 |
| 33588 | -64.651 | 0.122 | 9.524 | 0.061 | 6.73 |
| 33589 | -52.627 | 0.099 | 10.081 | 0.064 | 8.30 |
| 33590 | -49.557 | 0.094 | 9.027 | 0.058 | 8.97 |
| 33591 | -47.018 | 0.089 | 8.074 | 0.052 | 9.61 |
| 33592 | -33.594 | 0.063 | 8.368 | 0.053 | HIGH |
| 33593 | -15.809 | 0.030 | 5.027 | 0.032 | HIGH |
| 33594 | -7.909 | 0.015 | 11.827 | 0.076 | HIGH |
| 33595 | 27.163 | 0.051 | 4.689 | 0.030 | HIGH |
| 42201 | -253.285 | 0.478 | 15.087 | 0.096 | 1.02 |
| 42202 | 40.588 | 0.077 | 2.879 | 0.018 | HIGH |
| 42203 | 34.283 | 0.065 | 4.870 | 0.031 | HIGH |
| 42204 | -265.896 | 0.502 | 14.741 | 0.094 | 0.93 |
| 42205 | -49.253 | 0.093 | 24.219 | 0.155 | 6.63 |
| 42206 | 12.260 | 0.023 | 20.519 | 0.131 | HIGH |
| 42207 | -15.108 | 0.029 | 8.127 | 0.052 | HIGH |
| 42208 | 83.102 | 0.157 | 26.664 | 0.170 | 3.95 |
| 42215 | -174.558 | 0.329 | 10.233 | 0.065 | 1.96 |
| 42216 | -243.426 | 0.459 | 10.909 | 0.070 | 1.13 |
| 42222 | -61.871 | 0.117 | 21.528 | 0.137 | 5.77 |
| 42223 | -70.935 | 0.134 | 18.354 | 0.117 | 5.36 |
| 42224 | -152.285 | 0.287 | 48.565 | 0.310 | 1.40 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42225 | -148.459 | 0.280 | 3.167 | 0.020 | 2.56 |
| 42226 | -134.649 | 0.254 | 30.078 | 0.192 | 2.23 |
| 42227 | -106.128 | 0.200 | 9.672 | 0.062 | 3.81 |
| 42228 | -72.017 | 0.136 | 22.286 | 0.142 | 4.82 |
| 42229 | -116.373 | 0.220 | 26.681 | 0.170 | 2.78 |
| 42230 | -95.263 | 0.180 | 35.953 | 0.230 | 2.91 |
| 42231 | -92.061 | 0.174 | 39.623 | 0.253 | 2.79 |
| 42232 | -112.472 | 0.212 | 39.247 | 0.251 | 2.32 |
| 42233 | -130.980 | 0.247 | 43.746 | 0.279 | 1.82 |
| 42234 | -124.469 | 0.235 | 19.699 | 0.126 | 2.83 |
| 42235 | -94.135 | 0.178 | 9.962 | 0.064 | 4.39 |
| 42236 | -80.915 | 0.153 | 9.616 | 0.061 | 5.24 |
| 42237 | -52.373 | 0.099 | 8.820 | 0.056 | 8.49 |
| 42238 | -33.482 | 0.063 | 10.369 | 0.066 | HIGH |
| 42239 | -49.042 | 0.093 | 55.176 | 0.352 | 2.94 |
| 42240 | -111.295 | 0.210 | 131.083 | 0.837 | 0.06 |
| 42241 | -123.773 | 0.234 | 150.751 | 0.963 | -0.14 |
| 42242 | -124.889 | 0.236 | 105.939 | 0.676 | 0.35 |
| 42243 | -136.586 | 0.258 | 25.502 | 0.163 | 2.34 |
| 42244 | -144.349 | 0.272 | 44.120 | 0.282 | 1.62 |
| 42245 | -118.723 | 0.224 | 11.441 | 0.073 | 3.27 |
| 42246 | -33.365 | 0.063 | 16.764 | 0.107 | HIGH |
| 42247 | -74.224 | 0.140 | 9.010 | 0.058 | 5.81 |
| 42248 | -35.495 | 0.067 | 5.857 | 0.037 | HIGH |
| 42249 | 9.563 | 0.018 | 13.232 | 0.084 | HIGH |
| 42250 | 58.937 | 0.111 | 26.289 | 0.168 | 5.44 |
| 42251 | -176.626 | 0.333 | 446.057 | 2.848 | -0.85 |
| 42252 | -21.614 | 0.041 | 1.138 | 0.007 | HIGH |
| 42253 | -172.451 | 0.325 | 407.280 | 2.601 | -0.82 |
| 42254 | -141.179 | 0.266 | 28.824 | 0.185 | 2.14 |
| 42255 | -133.338 | 0.252 | 30.157 | 0.193 | 2.25 |
| 42256 | -135.181 | 0.255 | 28.536 | 0.182 | 2.27 |
| 42257 | -81.165 | 0.153 | 11.702 | 0.075 | 5.10 |
| 42258 | -49.043 | 0.093 | 6.744 | 0.043 | 9.35 |
| 42259 | -82.646 | 0.156 | 6.229 | 0.040 | 5.27 |
| 42260 | -34.370 | 0.065 | 3.282 | 0.021 | HIGH |
| 42261 | -15.234 | 0.029 | 4.511 | 0.029 | HIGH |
| 42262 | 10.929 | 0.021 | 63.547 | 0.406 | 3.41 |
| 42263 | 121.191 | 0.229 | 18.965 | 0.121 | 2.94 |
| 42264 | -54.334 | 0.103 | 228.107 | 1.457 | -0.51 |
| 42265 | -103.816 | 0.196 | 197.566 | 1.262 | -0.41 |
| 42266 | -106.721 | 0.201 | 70.767 | 0.452 | 1.22 |
| 42267 | -98.257 | 0.185 | 16.288 | 0.104 | 3.89 |
| 42268 | -96.037 | 0.181 | 16.016 | 0.102 | 4.01 |
| 42269 | -98.210 | 0.185 | 11.183 | 0.071 | 4.12 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42270 | -37.388 | 0.071 | 7.709 | 0.049 | HIGH |
| 42271 | -77.068 | 0.145 | 5.070 | 0.032 | 5.76 |
| 42272 | -36.736 | 0.069 | 5.877 | 0.038 | HIGH |
| 42273 | -70.807 | 0.134 | 12.592 | 0.080 | 5.86 |
| 42274 | -90.465 | 0.171 | 6.695 | 0.043 | 4.72 |
| 42275 | 85.285 | 0.161 | 5.600 | 0.036 | 5.10 |
| 42278 | -4.613 | 0.009 | 4.815 | 0.031 | HIGH |
| 42279 | -61.870 | 0.117 | 14.813 | 0.095 | 6.53 |
| 42280 | -136.205 | 0.257 | 20.783 | 0.133 | 2.49 |
| 42281 | -149.642 | 0.282 | 22.040 | 0.141 | 2.18 |
| 42282 | -206.086 | 0.389 | 20.248 | 0.129 | 1.40 |
| 42283 | -73.953 | 0.140 | 2.775 | 0.018 | 6.12 |
| 42286 | -53.054 | 0.100 | 9.523 | 0.061 | 8.30 |
| 42287 | -101.176 | 0.191 | 3.923 | 0.025 | 4.20 |
| 42288 | -139.538 | 0.263 | 8.863 | 0.057 | 2.71 |
| 42289 | -167.988 | 0.317 | 13.593 | 0.087 | 2.02 |
| 42290 | -204.075 | 0.385 | 22.314 | 0.142 | 1.39 |
| 42293 | -62.618 | 0.118 | 1.727 | 0.011 | 7.44 |
| 42294 | -84.110 | 0.159 | 4.067 | 0.026 | 5.24 |
| 42295 | -128.628 | 0.243 | 8.333 | 0.053 | 3.02 |
| 42296 | -147.445 | 0.278 | 9.855 | 0.063 | 2.50 |
| 42297 | -183.533 | 0.346 | 11.032 | 0.070 | 1.81 |
| 42300 | -27.575 | 0.052 | 11.870 | 0.076 | HIGH |
| 42301 | -55.073 | 0.104 | 17.114 | 0.109 | 7.02 |
| 42302 | -103.598 | 0.195 | 17.598 | 0.112 | 3.60 |
| 42303 | -88.048 | 0.166 | 14.605 | 0.093 | 4.50 |
| 42304 | -100.775 | 0.190 | 23.385 | 0.149 | 3.42 |
| 42308 | -16.175 | 0.031 | 72.544 | 0.463 | 2.44 |
| 42309 | 17.817 | 0.034 | 6.117 | 0.039 | HIGH |
| 42310 | -35.972 | 0.068 | 53.028 | 0.339 | 3.58 |
| 42311 | -70.203 | 0.132 | 48.084 | 0.307 | 2.86 |
| 42312 | -84.167 | 0.159 | 47.440 | 0.303 | 2.54 |
| 42316 | 68.865 | 0.130 | 27.963 | 0.179 | 4.59 |
| 42317 | 63.829 | 0.120 | 274.703 | 1.754 | -0.64 |
| 42318 | -19.390 | 0.037 | 125.271 | 0.800 | 0.40 |
| 42319 | -6.614 | 0.012 | 102.942 | 0.657 | 1.03 |
| 42320 | -15.981 | 0.030 | 33.868 | 0.216 | 9.13 |
| 42323 | 152.545 | 0.288 | 244.716 | 1.563 | -0.60 |
| 42324 | 21.744 | 0.041 | 1.720 | 0.011 | HIGH |
| 42325 | 41.186 | 0.078 | 337.023 | 2.152 | -0.74 |
| 42326 | 42.950 | 0.081 | 38.498 | 0.246 | 4.99 |
| 42327 | 58.686 | 0.111 | 44.065 | 0.281 | 3.56 |
| 42329 | 87.769 | 0.166 | 181.076 | 1.156 | -0.31 |
| 42330 | 89.239 | 0.169 | 149.633 | 0.956 | -0.08 |
| 42331 | 58.565 | 0.110 | 103.021 | 0.658 | 0.69 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42332 | 70.612 | 0.133 | 32.646 | 0.208 | 4.06 |
| 42333 | 94.465 | 0.178 | 36.346 | 0.232 | 2.91 |
| 42334 | 80.839 | 0.153 | 124.518 | 0.795 | 0.22 |
| 42335 | 71.266 | 0.134 | 59.755 | 0.382 | 2.13 |
| 42336 | 63.574 | 0.120 | 50.250 | 0.321 | 2.89 |
| 42337 | 74.244 | 0.140 | 45.026 | 0.288 | 2.95 |
| 42338 | 52.069 | 0.098 | 42.102 | 0.269 | 4.03 |
| 42339 | 48.561 | 0.092 | 33.245 | 0.212 | 5.33 |
| 42340 | 50.827 | 0.096 | 23.517 | 0.150 | 6.57 |
| 42341 | 21.664 | 0.041 | 12.886 | 0.082 | HIGH |
| 42342 | 21.071 | 0.040 | 12.277 | 0.078 | HIGH |
| 42343 | -10.465 | 0.020 | 9.491 | 0.061 | HIGH |
| 42346 | 17.580 | 0.033 | 36.287 | 0.232 | 8.04 |
| 42347 | -14.023 | 0.026 | 24.290 | 0.155 | HIGH |
| 42348 | 15.955 | 0.030 | 24.561 | 0.157 | HIGH |
| 42349 | 23.650 | 0.045 | 21.168 | 0.135 | HIGH |
| 42350 | 23.740 | 0.045 | 14.156 | 0.090 | HIGH |
| 42351 | 23.543 | 0.044 | 15.847 | 0.101 | HIGH |
| 42353 | -28.400 | 0.054 | 92.567 | 0.591 | 1.21 |
| 42354 | -33.466 | 0.063 | 34.078 | 0.218 | 6.55 |
| 42355 | -10.482 | 0.020 | 73.428 | 0.469 | 2.50 |
| 42356 | 1.274 | 0.002 | 74.303 | 0.474 | 2.65 |
| 42357 | -6.079 | 0.011 | 35.193 | 0.225 | HIGH |
| 42358 | -6.305 | 0.012 | 38.065 | 0.243 | 9.40 |
| 42361 | -6.217 | 0.012 | 73.619 | 0.470 | 2.59 |
| 42362 | -11.284 | 0.021 | 55.269 | 0.353 | 4.47 |
| 42363 | -10.455 | 0.020 | 136.126 | 0.869 | 0.25 |
| 42364 | -41.033 | 0.077 | 89.459 | 0.571 | 1.21 |
| 42365 | -47.503 | 0.090 | 78.615 | 0.502 | 1.57 |
| 42368 | 45.838 | 0.086 | 50.149 | 0.320 | 3.49 |
| 42369 | 24.006 | 0.045 | 47.857 | 0.306 | 4.85 |
| 42370 | 37.024 | 0.070 | 128.154 | 0.818 | 0.29 |
| 42371 | -100.605 | 0.190 | 234.735 | 1.499 | -0.55 |
| 42372 | -93.984 | 0.177 | 170.963 | 1.092 | -0.26 |
| 42375 | 72.139 | 0.136 | 20.864 | 0.133 | 5.04 |
| 42376 | -9.719 | 0.018 | 33.863 | 0.216 | HIGH |
| 42377 | -44.701 | 0.084 | 127.475 | 0.814 | 0.28 |
| 42378 | -26.101 | 0.049 | 1.294 | 0.008 | HIGH |
| 42379 | -80.647 | 0.152 | 184.856 | 1.180 | -0.33 |
| 42383 | 64.788 | 0.122 | 11.255 | 0.072 | 6.56 |
| 42384 | 41.551 | 0.078 | 8.004 | 0.051 | HIGH |
| 42385 | 57.572 | 0.109 | 16.656 | 0.106 | 6.79 |
| 42386 | -82.286 | 0.155 | 68.832 | 0.440 | 1.55 |
| 42387 | -80.492 | 0.152 | 82.205 | 0.525 | 1.10 |
| 42390 | 76.432 | 0.144 | 10.278 | 0.066 | 5.55 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42391 | 48.312 | 0.091 | 8.472 | 0.054 | 9.29 |
| 42392 | 30.089 | 0.057 | 9.001 | 0.057 | HIGH |
| 42393 | -18.416 | 0.035 | 21.906 | 0.140 | HIGH |
| 42394 | -34.361 | 0.065 | 32.667 | 0.209 | 6.74 |
| 42396 | 126.366 | 0.238 | 1.687 | 0.011 | 3.19 |
| 42397 | 71.204 | 0.134 | 35.091 | 0.224 | 3.82 |
| 42398 | 43.239 | 0.082 | 4.935 | 0.032 | HIGH |
| 42399 | -1.290 | 0.002 | 10.295 | 0.066 | HIGH |
| 42400 | -27.608 | 0.052 | 23.468 | 0.150 | HIGH |
| 42401 | 90.836 | 0.171 | 19.764 | 0.126 | 4.05 |
| 42402 | 87.049 | 0.164 | 13.029 | 0.083 | 4.65 |
| 42403 | 74.305 | 0.140 | 7.495 | 0.048 | 5.89 |
| 42404 | 36.057 | 0.068 | 4.011 | 0.026 | HIGH |
| 42405 | 17.674 | 0.033 | 5.427 | 0.035 | HIGH |
| 42406 | 100.318 | 0.189 | 47.280 | 0.302 | 2.20 |
| 42407 | 63.020 | 0.119 | 13.319 | 0.085 | 6.56 |
| 42408 | 52.377 | 0.099 | 9.784 | 0.062 | 8.38 |
| 42409 | 55.424 | 0.105 | 2.754 | 0.018 | 8.49 |
| 42410 | 111.908 | 0.211 | 11.380 | 0.073 | 3.52 |
| 42411 | 51.198 | 0.097 | 14.711 | 0.094 | 7.89 |
| 42412 | 46.508 | 0.088 | 8.500 | 0.054 | 9.65 |
| 42413 | 99.910 | 0.189 | 4.767 | 0.030 | 4.24 |
| 42414 | 62.067 | 0.117 | 7.419 | 0.047 | 7.20 |
| 42415 | 59.682 | 0.113 | 11.922 | 0.076 | 7.09 |
| 42455 | -140.312 | 0.265 | 63.952 | 0.408 | 1.11 |
| 42456 | -257.498 | 0.486 | 43.979 | 0.281 | 0.68 |
| 43301 | 596.823 | 1.126 | 6.750 | 0.043 | -0.12 |
| 43302 | -353.339 | 0.667 | 17.073 | 0.109 | 0.45 |
| 43303 | -609.631 | 1.150 | 22.840 | 0.146 | -0.16 |
| 43304 | 837.017 | 1.579 | 5.687 | 0.036 | -0.37 |
| 43305 | -524.745 | 0.990 | 4.456 | 0.028 | 0.01 |
| 43306 | 492.072 | 0.928 | 10.725 | 0.068 | 0.07 |
| 43307 | -269.135 | 0.508 | 0.146 | 0.001 | 0.97 |
| 43308 | 332.684 | 0.628 | 5.002 | 0.032 | 0.59 |
| 43313 | 455.865 | 0.860 | 7.849 | 0.050 | 0.16 |
| 43314 | 642.948 | 1.213 | 2.477 | 0.016 | -0.18 |
| 43319 | -324.062 | 0.611 | 2.452 | 0.016 | 0.63 |
| 43320 | -203.881 | 0.385 | 2.487 | 0.016 | 1.59 |
| 43321 | 497.087 | 0.938 | 15.135 | 0.097 | 0.05 |
| 43322 | 572.954 | 1.081 | 5.602 | 0.036 | -0.08 |
| 43323 | 404.955 | 0.764 | 5.478 | 0.035 | 0.30 |
| 43324 | 303.198 | 0.572 | 102.501 | 0.655 | -0.05 |
| 43327 | -127.096 | 0.240 | 105.643 | 0.675 | 0.35 |
| 43328 | -193.747 | 0.366 | 3.529 | 0.023 | 1.73 |
| 43329 | -265.280 | 0.501 | 2.655 | 0.017 | 0.99 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43330 | -234.651 | 0.443 | 4.935 | 0.032 | 1.25 |
| 43331 | 410.763 | 0.775 | 16.146 | 0.103 | 0.26 |
| 43332 | 370.368 | 0.699 | 11.309 | 0.072 | 0.41 |
| 43333 | 294.764 | 0.556 | 6.761 | 0.043 | 0.78 |
| 43334 | 79.239 | 0.150 | 76.382 | 0.488 | 1.30 |
| 43338 | 57.335 | 0.108 | 56.927 | 0.364 | 2.59 |
| 43339 | -93.817 | 0.177 | 4.373 | 0.028 | 4.59 |
| 43340 | -132.426 | 0.250 | 3.738 | 0.024 | 2.98 |
| 43341 | -178.794 | 0.337 | 4.283 | 0.027 | 1.95 |
| 43342 | 331.859 | 0.626 | 11.587 | 0.074 | 0.57 |
| 43343 | 292.903 | 0.553 | 12.977 | 0.083 | 0.77 |
| 43344 | 313.365 | 0.591 | 8.844 | 0.056 | 0.67 |
| 43345 | 312.799 | 0.590 | 25.828 | 0.165 | 0.58 |
| 43346 | -286.719 | 0.541 | 29.825 | 0.190 | 0.68 |
| 43349 | 330.496 | 0.624 | 25.878 | 0.165 | 0.50 |
| 43350 | -126.990 | 0.240 | 17.574 | 0.112 | 2.83 |
| 43351 | -122.200 | 0.231 | 5.032 | 0.032 | 3.29 |
| 43352 | -96.242 | 0.182 | 3.093 | 0.020 | 4.48 |
| 43353 | -134.657 | 0.254 | 3.546 | 0.023 | 2.92 |
| 43354 | 230.871 | 0.436 | 9.060 | 0.058 | 1.26 |
| 43355 | 219.747 | 0.415 | 10.546 | 0.067 | 1.36 |
| 43356 | 248.368 | 0.469 | 8.112 | 0.052 | 1.11 |
| 43357 | 250.591 | 0.473 | 6.218 | 0.040 | 1.10 |
| 43358 | 171.042 | 0.323 | 22.970 | 0.147 | 1.80 |
| 43359 | 164.482 | 0.310 | 26.911 | 0.172 | 1.81 |
| 43360 | 19.985 | 0.038 | 20.576 | 0.131 | HIGH |
| 43361 | -103.283 | 0.195 | 8.016 | 0.051 | 3.99 |
| 43362 | -38.076 | 0.072 | 13.347 | 0.085 | HIGH |
| 43363 | -97.862 | 0.185 | 10.781 | 0.069 | 4.16 |
| 43364 | -88.393 | 0.167 | 3.604 | 0.023 | 4.95 |
| 43365 | -59.551 | 0.112 | 2.008 | 0.013 | 7.86 |
| 43366 | -75.861 | 0.143 | 1.666 | 0.011 | 5.97 |
| 43367 | 119.518 | 0.226 | 28.197 | 0.180 | 2.63 |
| 43368 | 171.438 | 0.323 | 9.746 | 0.062 | 2.02 |
| 43369 | 188.564 | 0.356 | 4.154 | 0.027 | 1.80 |
| 43370 | 182.896 | 0.345 | 2.875 | 0.018 | 1.89 |
| 43371 | 136.828 | 0.258 | 7.351 | 0.047 | 2.80 |
| 43372 | 120.468 | 0.227 | 11.396 | 0.073 | 3.21 |
| 43373 | 74.305 | 0.140 | 10.289 | 0.066 | 5.72 |
| 43374 | -6.182 | 0.012 | 9.038 | 0.058 | HIGH |
| 43375 | -26.405 | 0.050 | 7.099 | 0.045 | HIGH |
| 43376 | -30.034 | 0.057 | 6.978 | 0.045 | HIGH |
| 43377 | -57.407 | 0.108 | 4.444 | 0.028 | 8.07 |
| 43378 | -53.371 | 0.101 | 1.552 | 0.010 | 8.90 |
| 43379 | -38.629 | 0.073 | 2.874 | 0.018 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43380 | -19.406 | 0.037 | 20.592 | 0.131 | HIGH |
| 43382 | 168.255 | 0.317 | 20.015 | 0.128 | 1.90 |
| 43383 | 143.711 | 0.271 | 2.873 | 0.018 | 2.68 |
| 43384 | 131.220 | 0.248 | 1.043 | 0.007 | 3.04 |
| 43385 | 105.216 | 0.199 | 1.718 | 0.011 | 4.03 |
| 43386 | 86.222 | 0.163 | 3.345 | 0.021 | 5.10 |
| 43387 | 67.195 | 0.127 | 2.836 | 0.018 | 6.83 |
| 43388 | 38.486 | 0.073 | 3.426 | 0.022 | HIGH |
| 43389 | 12.113 | 0.023 | 1.946 | 0.012 | HIGH |
| 43390 | -1.577 | 0.003 | 1.895 | 0.012 | HIGH |
| 43391 | -10.714 | 0.020 | 1.280 | 0.008 | HIGH |
| 43392 | -22.222 | 0.042 | 0.875 | 0.006 | HIGH |
| 43393 | -15.861 | 0.030 | 2.636 | 0.017 | HIGH |
| 43394 | -9.869 | 0.019 | 8.350 | 0.053 | HIGH |
| 43397 | 380.360 | 0.718 | 35.115 | 0.224 | 0.26 |
| 43398 | 264.170 | 0.498 | 3.930 | 0.025 | 1.00 |
| 43399 | 192.635 | 0.363 | 1.400 | 0.009 | 1.75 |
| 43400 | 141.303 | 0.267 | 5.032 | 0.032 | 2.72 |
| 43401 | 82.104 | 0.155 | 8.045 | 0.051 | 5.23 |
| 43402 | -93.874 | 0.177 | 7.323 | 0.047 | 4.50 |
| 43403 | -559.228 | 1.055 | 25.808 | 0.165 | -0.09 |
| 43406 | 242.183 | 0.457 | 19.621 | 0.125 | 1.07 |
| 43407 | 299.252 | 0.565 | 10.019 | 0.064 | 0.75 |
| 43408 | 282.601 | 0.533 | 4.931 | 0.031 | 0.87 |
| 43409 | 254.491 | 0.480 | 5.729 | 0.037 | 1.07 |
| 43410 | 234.498 | 0.442 | 14.748 | 0.094 | 1.18 |
| 43411 | 310.082 | 0.585 | 16.195 | 0.103 | 0.66 |
| 43412 | 395.775 | 0.747 | 17.019 | 0.109 | 0.30 |
| 43413 | -52.939 | 0.100 | 62.991 | 0.402 | 2.30 |
| 43415 | 280.642 | 0.530 | 11.344 | 0.072 | 0.85 |
| 43416 | 332.245 | 0.627 | 11.064 | 0.071 | 0.57 |
| 43417 | 338.302 | 0.638 | 7.973 | 0.051 | 0.55 |
| 43418 | 336.497 | 0.635 | 13.902 | 0.089 | 0.54 |
| 43419 | 337.480 | 0.637 | 25.929 | 0.166 | 0.47 |
| 43420 | 564.601 | 1.065 | 29.367 | 0.188 | -0.11 |
| 43421 | 676.360 | 1.276 | 55.642 | 0.355 | -0.31 |
| 43424 | 314.561 | 0.594 | 15.703 | 0.100 | 0.64 |
| 43425 | 383.477 | 0.724 | 15.306 | 0.098 | 0.35 |
| 43426 | 429.764 | 0.811 | 8.071 | 0.052 | 0.22 |
| 43427 | 509.395 | 0.961 | 27.265 | 0.174 | -0.01 |
| 43428 | 920.236 | 1.736 | 60.437 | 0.386 | -0.48 |
| 43430 | 481.642 | 0.909 | 112.638 | 0.719 | -0.32 |
| 43432 | 339.961 | 0.641 | 21.496 | 0.137 | 0.49 |
| 43433 | 404.121 | 0.762 | 17.811 | 0.114 | 0.27 |
| 43434 | 420.838 | 0.794 | 21.910 | 0.140 | 0.21 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43435 | 379.067 | 0.715 | 99.052 | 0.633 | -0.14 |
| 43438 | 1056.510 | 1.993 | 103.716 | 0.662 | -0.60 |
| 43440 | 356.181 | 0.672 | 29.835 | 0.191 | 0.38 |
| 43441 | 421.253 | 0.795 | 14.830 | 0.095 | 0.23 |
| 43442 | 467.653 | 0.882 | 32.590 | 0.208 | 0.06 |
| 43443 | 520.725 | 0.983 | 66.179 | 0.423 | -0.17 |
| 43446 | 690.682 | 1.303 | 157.294 | 1.004 | -0.57 |
| 43450 | 362.813 | 0.685 | 31.339 | 0.200 | 0.34 |
| 43451 | 437.037 | 0.825 | 17.562 | 0.112 | 0.18 |
| 43452 | 517.550 | 0.977 | 39.797 | 0.254 | -0.06 |
| 43453 | 318.061 | 0.600 | 51.461 | 0.329 | 0.35 |
| 43455 | 778.825 | 1.469 | 46.730 | 0.298 | -0.37 |
| 43456 | 793.430 | 1.497 | 20.700 | 0.132 | -0.34 |
| 43457 | 229.402 | 0.433 | 28.275 | 0.181 | 1.07 |
| 43459 | 355.788 | 0.671 | 23.883 | 0.153 | 0.41 |
| 43460 | 425.497 | 0.803 | 20.421 | 0.130 | 0.20 |
| 43461 | 453.053 | 0.855 | 20.541 | 0.131 | 0.13 |
| 43462 | 319.435 | 0.603 | 24.803 | 0.158 | 0.56 |
| 43463 | 517.954 | 0.977 | 27.441 | 0.175 | -0.02 |
| 43464 | 674.771 | 1.273 | 26.144 | 0.167 | -0.24 |
| 43465 | 704.736 | 1.330 | 7.870 | 0.050 | -0.25 |
| 43467 | 339.958 | 0.641 | 10.245 | 0.065 | 0.54 |
| 43468 | 393.198 | 0.742 | 13.410 | 0.086 | 0.32 |
| 43469 | 388.046 | 0.732 | 13.285 | 0.085 | 0.34 |
| 43470 | 447.971 | 0.845 | 12.252 | 0.078 | 0.17 |
| 43471 | 443.665 | 0.837 | 12.817 | 0.082 | 0.18 |
| 43472 | 482.482 | 0.910 | 9.010 | 0.058 | 0.09 |
| 43473 | 392.554 | 0.741 | 4.389 | 0.028 | 0.35 |
| 43474 | 316.813 | 0.598 | 8.557 | 0.055 | 0.66 |
| 43475 | 362.031 | 0.683 | 8.269 | 0.053 | 0.45 |
| 43476 | 389.744 | 0.735 | 5.874 | 0.038 | 0.35 |
| 43477 | 380.786 | 0.718 | 6.793 | 0.043 | 0.38 |
| 43478 | 355.408 | 0.671 | 6.794 | 0.043 | 0.48 |
| 43479 | 346.307 | 0.653 | 3.890 | 0.025 | 0.53 |
| 43480 | 291.750 | 0.550 | 8.403 | 0.054 | 0.80 |
| 43481 | 336.672 | 0.635 | 5.893 | 0.038 | 0.57 |
| 43482 | 333.127 | 0.629 | 2.245 | 0.014 | 0.59 |
| 43483 | 304.887 | 0.575 | 3.208 | 0.020 | 0.74 |
| 43484 | 296.455 | 0.559 | 3.004 | 0.019 | 0.78 |
| 43485 | 260.654 | 0.492 | 8.155 | 0.052 | 1.01 |
| 43486 | 285.187 | 0.538 | 3.677 | 0.023 | 0.85 |
| 43487 | 270.987 | 0.511 | 2.808 | 0.018 | 0.95 |
| 43488 | 250.594 | 0.473 | 1.484 | 0.009 | 1.11 |
| 43489 | 218.201 | 0.412 | 3.931 | 0.025 | 1.42 |
| 43490 | 239.940 | 0.453 | 7.022 | 0.045 | 1.19 |

5.5.3

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43491 | 195.839 | 0.370 | 6.058 | 0.039 | 1.68 |
| 43492 | 308.512 | 0.582 | 22.279 | 0.142 | 0.63 |
| 43499 | 410.769 | 0.775 | 8.148 | 0.052 | 0.28 |
| 43500 | 63.070 | 0.119 | 4.470 | 0.029 | 7.27 |
| 43501 | -72.173 | 0.136 | 3.846 | 0.025 | 6.26 |
| 43502 | -123.307 | 0.233 | 0.719 | 0.005 | 3.30 |
| 43503 | -170.301 | 0.321 | 1.040 | 0.007 | 2.11 |
| 43504 | -230.971 | 0.436 | 2.261 | 0.014 | 1.29 |
| 43505 | -312.766 | 0.590 | 19.690 | 0.126 | 0.62 |
| 43509 | -211.991 | 0.400 | 12.926 | 0.083 | 1.42 |
| 43510 | -202.583 | 0.382 | 11.234 | 0.072 | 1.55 |
| 43511 | -163.932 | 0.309 | 3.172 | 0.020 | 2.22 |
| 43512 | -189.508 | 0.358 | 2.767 | 0.018 | 1.79 |
| 43513 | -217.945 | 0.411 | 2.757 | 0.018 | 1.43 |
| 43514 | -232.337 | 0.438 | 5.889 | 0.038 | 1.26 |
| 43515 | -210.403 | 0.397 | 11.249 | 0.072 | 1.46 |
| 43518 | -433.978 | 0.819 | 39.828 | 0.254 | 0.10 |
| 43519 | -377.154 | 0.712 | 23.161 | 0.148 | 0.34 |
| 43520 | -235.615 | 0.445 | 6.857 | 0.044 | 1.23 |
| 43521 | -240.091 | 0.453 | 5.051 | 0.032 | 1.20 |
| 43522 | -249.227 | 0.470 | 4.516 | 0.029 | 1.12 |
| 43523 | -252.947 | 0.477 | 5.187 | 0.033 | 1.08 |
| 43524 | -227.011 | 0.428 | 5.498 | 0.035 | 1.32 |
| 43526 | -325.983 | 0.615 | 102.485 | 0.654 | -0.08 |
| 43528 | -681.293 | 1.285 | 36.519 | 0.233 | -0.27 |
| 43529 | -376.932 | 0.711 | 12.676 | 0.081 | 0.38 |
| 43530 | -317.088 | 0.598 | 6.265 | 0.040 | 0.66 |
| 43531 | -289.525 | 0.546 | 4.243 | 0.027 | 0.82 |
| 43532 | -242.445 | 0.457 | 6.603 | 0.042 | 1.17 |
| 43534 | -827.910 | 1.562 | 66.044 | 0.422 | -0.44 |
| 43537 | -200.296 | 0.378 | 28.442 | 0.182 | 1.33 |
| 43538 | -308.486 | 0.582 | 4.101 | 0.026 | 0.71 |
| 43539 | -308.996 | 0.583 | 0.761 | 0.005 | 0.71 |
| 43540 | -261.318 | 0.493 | 7.469 | 0.048 | 1.01 |
| 43544 | -612.642 | 1.156 | 144.177 | 0.921 | -0.51 |
| 43547 | -416.568 | 0.786 | 45.545 | 0.291 | 0.11 |
| 43548 | -379.870 | 0.717 | 9.812 | 0.063 | 0.38 |
| 43549 | -345.460 | 0.652 | 7.633 | 0.049 | 0.52 |
| 43550 | -290.101 | 0.547 | 7.675 | 0.049 | 0.81 |
| 43553 | -829.901 | 1.566 | 44.870 | 0.287 | -0.40 |
| 43554 | -817.113 | 1.542 | 53.874 | 0.344 | -0.41 |
| 43556 | -226.733 | 0.428 | 45.771 | 0.292 | 0.84 |
| 43557 | -477.994 | 0.902 | 21.141 | 0.135 | 0.07 |
| 43558 | -397.591 | 0.750 | 13.563 | 0.087 | 0.31 |
| 43559 | -326.728 | 0.616 | 13.662 | 0.087 | 0.59 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43561 | -876.974 | 1.655 | 25.117 | 0.160 | -0.41 |
| 43562 | -771.430 | 1.456 | 18.597 | 0.119 | -0.32 |
| 43563 | -565.046 | 1.066 | 31.140 | 0.199 | -0.11 |
| 43564 | -340.850 | 0.643 | 33.655 | 0.215 | 0.41 |
| 43565 | -470.698 | 0.888 | 24.380 | 0.156 | 0.08 |
| 43566 | -424.525 | 0.801 | 12.635 | 0.081 | 0.23 |
| 43567 | -349.680 | 0.660 | 23.056 | 0.147 | 0.44 |
| 43568 | -437.014 | 0.825 | 18.364 | 0.117 | 0.18 |
| 43569 | -595.914 | 1.124 | 15.918 | 0.102 | -0.12 |
| 43570 | -520.403 | 0.982 | 19.709 | 0.126 | -0.01 |
| 43571 | -519.483 | 0.980 | 22.066 | 0.141 | -0.01 |
| 43572 | -440.008 | 0.830 | 23.393 | 0.149 | 0.15 |
| 43573 | -423.431 | 0.799 | 11.820 | 0.075 | 0.23 |
| 43574 | -358.446 | 0.676 | 27.738 | 0.177 | 0.38 |
| 43575 | -402.179 | 0.759 | 23.013 | 0.147 | 0.26 |
| 43576 | -443.168 | 0.836 | 8.030 | 0.051 | 0.19 |
| 43577 | -463.183 | 0.874 | 16.340 | 0.104 | 0.12 |
| 43578 | -465.041 | 0.877 | 16.408 | 0.105 | 0.12 |
| 43579 | -418.834 | 0.790 | 13.793 | 0.088 | 0.24 |
| 43580 | -355.468 | 0.671 | 23.574 | 0.151 | 0.41 |
| 43581 | -355.007 | 0.670 | 19.551 | 0.125 | 0.44 |
| 43582 | -387.344 | 0.731 | 8.202 | 0.052 | 0.36 |
| 43583 | -415.474 | 0.784 | 10.121 | 0.065 | 0.26 |
| 43584 | -409.473 | 0.773 | 10.386 | 0.066 | 0.28 |
| 43585 | -341.894 | 0.645 | 14.284 | 0.091 | 0.51 |
| 43586 | -301.354 | 0.569 | 11.758 | 0.075 | 0.73 |
| 43587 | -346.960 | 0.655 | 2.309 | 0.015 | 0.53 |
| 43588 | -363.642 | 0.686 | 6.161 | 0.039 | 0.45 |
| 43589 | -313.619 | 0.592 | 6.230 | 0.040 | 0.68 |
| 43590 | -223.848 | 0.422 | 2.471 | 0.016 | 1.36 |
| 43591 | -313.178 | 0.591 | 11.168 | 0.071 | 0.66 |
| 43592 | -256.825 | 0.485 | 8.749 | 0.056 | 1.04 |
| 43594 | -289.103 | 0.545 | 44.106 | 0.282 | 0.53 |
| 52201 | 241.893 | 0.456 | 11.062 | 0.071 | 1.15 |
| 52202 | -150.660 | 0.284 | 8.375 | 0.053 | 2.45 |
| 52204 | 315.258 | 0.595 | 3.209 | 0.020 | 0.68 |
| 52205 | 197.031 | 0.372 | 12.899 | 0.082 | 1.60 |
| 52206 | -165.417 | 0.312 | 10.191 | 0.065 | 2.12 |
| 52207 | 220.444 | 0.416 | 24.656 | 0.157 | 1.20 |
| 52208 | -197.251 | 0.372 | 16.377 | 0.105 | 1.55 |
| 52215 | 231.495 | 0.437 | 28.099 | 0.179 | 1.06 |
| 52216 | 171.699 | 0.324 | 0.710 | 0.005 | 2.09 |
| 52222 | 331.271 | 0.625 | 18.674 | 0.119 | 0.54 |
| 52223 | 335.607 | 0.633 | 17.452 | 0.111 | 0.53 |
| 52224 | 184.954 | 0.349 | 39.165 | 0.250 | 1.29 |

5.5.91

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52225 | 186.593 | 0.352 | 15.741 | 0.101 | 1.70 |
| 52226 | 217.169 | 0.410 | 4.088 | 0.026 | 1.43 |
| 52227 | 294.125 | 0.555 | 17.728 | 0.113 | 0.73 |
| 52228 | 205.213 | 0.387 | 12.233 | 0.078 | 1.51 |
| 52229 | 200.796 | 0.379 | 1.961 | 0.013 | 1.64 |
| 52230 | 109.835 | 0.207 | 14.611 | 0.093 | 3.48 |
| 52231 | 356.225 | 0.672 | 23.863 | 0.152 | 0.41 |
| 52232 | 168.813 | 0.319 | 24.767 | 0.158 | 1.79 |
| 52233 | 179.111 | 0.338 | 74.775 | 0.477 | 0.63 |
| 52234 | 148.234 | 0.280 | 24.800 | 0.158 | 2.13 |
| 52235 | 158.968 | 0.300 | 17.742 | 0.113 | 2.10 |
| 52236 | 156.537 | 0.295 | 2.826 | 0.018 | 2.38 |
| 52237 | 144.686 | 0.273 | 2.711 | 0.017 | 2.65 |
| 52238 | 162.107 | 0.306 | 19.421 | 0.124 | 2.01 |
| 52239 | 105.277 | 0.199 | 15.294 | 0.098 | 3.64 |
| 52240 | 44.770 | 0.084 | 61.854 | 0.395 | 2.56 |
| 52241 | 246.748 | 0.466 | 37.116 | 0.237 | 0.83 |
| 52242 | 303.542 | 0.573 | 270.909 | 1.730 | -0.69 |
| 52243 | 47.319 | 0.089 | 1.626 | 0.010 | HIGH |
| 52244 | 174.591 | 0.329 | 185.994 | 1.188 | -0.41 |
| 52245 | 88.191 | 0.166 | 8.667 | 0.055 | 4.79 |
| 52246 | 98.493 | 0.186 | 10.866 | 0.069 | 4.12 |
| 52247 | 136.394 | 0.257 | 1.704 | 0.011 | 2.88 |
| 52248 | 100.446 | 0.190 | 1.452 | 0.009 | 4.27 |
| 52249 | 61.152 | 0.115 | 11.843 | 0.076 | 6.92 |
| 52250 | 111.266 | 0.210 | 13.538 | 0.086 | 3.47 |
| 52251 | 70.890 | 0.134 | 12.336 | 0.079 | 5.87 |
| 52252 | 112.574 | 0.212 | 10.879 | 0.069 | 3.51 |
| 52253 | 92.267 | 0.174 | 29.797 | 0.190 | 3.37 |
| 52254 | 108.310 | 0.204 | 158.523 | 1.012 | -0.18 |
| 52255 | 130.326 | 0.246 | 189.472 | 1.210 | -0.39 |
| 52256 | 128.924 | 0.243 | 74.694 | 0.477 | 0.93 |
| 52257 | 22.358 | 0.042 | 2.169 | 0.014 | HIGH |
| 52258 | 68.866 | 0.130 | 2.026 | 0.013 | 6.67 |
| 52259 | 39.786 | 0.075 | 3.754 | 0.024 | HIGH |
| 52260 | 78.279 | 0.148 | 2.058 | 0.013 | 5.75 |
| 52261 | 136.610 | 0.258 | 9.716 | 0.062 | 2.77 |
| 52262 | -3.282 | 0.006 | 7.096 | 0.045 | HIGH |
| 52263 | 33.676 | 0.064 | 5.647 | 0.036 | HIGH |
| 52264 | 52.628 | 0.099 | 2.682 | 0.017 | 8.99 |
| 52265 | 47.509 | 0.090 | 4.684 | 0.030 | 9.89 |
| 52266 | 49.320 | 0.093 | 41.042 | 0.262 | 4.29 |
| 52267 | 90.512 | 0.171 | 75.389 | 0.481 | 1.23 |
| 52268 | 96.925 | 0.183 | 41.272 | 0.264 | 2.57 |
| 52269 | 113.683 | 0.215 | 31.274 | 0.200 | 2.65 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52270 | 130.380 | 0.246 | 4.439 | 0.028 | 3.03 |
| 52271 | 102.590 | 0.194 | 1.195 | 0.008 | 4.16 |
| 52272 | 99.317 | 0.187 | 2.213 | 0.014 | 4.32 |
| 52273 | 106.939 | 0.202 | 1.495 | 0.010 | 3.95 |
| 52274 | 101.780 | 0.192 | 1.586 | 0.010 | 4.20 |
| 52275 | -126.772 | 0.239 | 7.440 | 0.048 | 3.10 |
| 52278 | 87.995 | 0.166 | 6.590 | 0.042 | 4.88 |
| 52279 | 158.050 | 0.298 | 2.205 | 0.014 | 2.35 |
| 52280 | 4.244 | 0.008 | 0.080 | 0.001 | HIGH |
| 52281 | 205.144 | 0.387 | 1.274 | 0.008 | 1.58 |
| 52282 | 206.645 | 0.390 | 3.668 | 0.023 | 1.56 |
| 52283 | 167.739 | 0.316 | 7.388 | 0.047 | 2.11 |
| 52286 | 171.536 | 0.324 | 3.077 | 0.020 | 2.08 |
| 52287 | 159.158 | 0.300 | 0.692 | 0.004 | 2.33 |
| 52288 | 159.733 | 0.301 | 0.616 | 0.004 | 2.32 |
| 52289 | 182.550 | 0.344 | 0.841 | 0.005 | 1.90 |
| 52290 | 235.488 | 0.444 | 1.057 | 0.007 | 1.25 |
| 52293 | 126.699 | 0.239 | 9.093 | 0.058 | 3.07 |
| 52294 | 167.164 | 0.315 | 0.524 | 0.003 | 2.17 |
| 52295 | 16.133 | 0.030 | 0.067 | 0.000 | HIGH |
| 52296 | 229.413 | 0.433 | 5.175 | 0.033 | 1.30 |
| 52297 | 346.492 | 0.654 | 6.926 | 0.044 | 0.52 |
| 52300 | 93.851 | 0.177 | 7.549 | 0.048 | 4.49 |
| 52301 | 161.069 | 0.304 | 5.549 | 0.035 | 2.26 |
| 52302 | 171.657 | 0.324 | 6.951 | 0.044 | 2.05 |
| 52303 | 227.691 | 0.430 | 16.514 | 0.105 | 1.23 |
| 52304 | 234.969 | 0.443 | 22.464 | 0.143 | 1.10 |
| 52308 | 153.934 | 0.290 | 17.500 | 0.112 | 2.20 |
| 52309 | 120.297 | 0.227 | 18.269 | 0.117 | 3.00 |
| 52310 | 160.663 | 0.303 | 31.330 | 0.200 | 1.75 |
| 52311 | 221.032 | 0.417 | 39.544 | 0.253 | 0.97 |
| 52312 | 392.881 | 0.741 | 22.087 | 0.141 | 0.29 |
| 52316 | 91.745 | 0.173 | 29.976 | 0.191 | 3.38 |
| 52317 | 74.358 | 0.140 | 30.419 | 0.194 | 4.07 |
| 52318 | 32.725 | 0.062 | 120.896 | 0.772 | 0.43 |
| 52319 | 284.263 | 0.536 | 22.828 | 0.146 | 0.75 |
| 52320 | 51.528 | 0.097 | 5.938 | 0.038 | 8.95 |
| 52323 | 55.553 | 0.105 | 57.539 | 0.367 | 2.59 |
| 52324 | 63.457 | 0.120 | 38.052 | 0.243 | 3.91 |
| 52325 | 84.597 | 0.160 | 73.373 | 0.469 | 1.35 |
| 52326 | 28.232 | 0.053 | 137.040 | 0.875 | 0.18 |
| 52327 | -341.536 | 0.644 | 15.120 | 0.097 | 0.51 |
| 52329 | 12.799 | 0.024 | 94.570 | 0.604 | 1.28 |
| 52330 | 12.931 | 0.024 | 77.394 | 0.494 | 2.17 |
| 52331 | -2.592 | 0.005 | 138.402 | 0.884 | 0.23 |

I:OGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52332 | -133.782 | 0.252 | 129.248 | 0.825 | 0.03 |
| 52333 | -124.941 | 0.236 | 54.398 | 0.347 | 1.55 |
| 52334 | -33.944 | 0.064 | 143.367 | 0.916 | 0.09 |
| 52335 | -75.437 | 0.142 | 310.534 | 1.983 | -0.71 |
| 52336 | -10.674 | 0.020 | 0.114 | 0.001 | HIGH |
| 52337 | -5.854 | 0.011 | 162.573 | 1.038 | -0.07 |
| 52338 | -47.516 | 0.090 | 114.475 | 0.731 | 0.50 |
| 52339 | -52.588 | 0.099 | 130.516 | 0.833 | 0.21 |
| 52340 | 23.150 | 0.044 | 4.981 | 0.032 | HIGH |
| 52341 | -39.554 | 0.075 | 15.262 | 0.097 | 9.91 |
| 52342 | -59.646 | 0.113 | 24.061 | 0.154 | 5.66 |
| 52343 | -56.546 | 0.107 | 33.778 | 0.216 | 4.72 |
| 52346 | -102.772 | 0.194 | 6.665 | 0.043 | 4.05 |
| 52347 | 132.195 | 0.249 | 10.608 | 0.068 | 2.87 |
| 52348 | -1.796 | 0.003 | 97.595 | 0.623 | 1.27 |
| 52349 | 0.592 | 0.001 | 23.863 | 0.152 | HIGH |
| 52350 | 5.519 | 0.010 | 44.738 | 0.286 | 7.19 |
| 52351 | -16.134 | 0.030 | 7.935 | 0.051 | HIGH |
| 52353 | 518.290 | 0.978 | 8.559 | 0.055 | 0.02 |
| 52354 | 462.988 | 0.874 | 13.762 | 0.088 | 0.13 |
| 52355 | 192.361 | 0.363 | 284.911 | 1.819 | -0.69 |
| 52356 | 9.956 | 0.019 | 0.508 | 0.003 | HIGH |
| 52357 | 27.214 | 0.051 | 205.611 | 1.313 | -0.40 |
| 52358 | 18.275 | 0.034 | 67.392 | 0.430 | 2.80 |
| 52361 | 425.422 | 0.803 | 22.518 | 0.144 | 0.20 |
| 52362 | 182.288 | 0.344 | 25.297 | 0.162 | 1.60 |
| 52363 | 125.066 | 0.236 | 67.195 | 0.429 | 1.16 |
| 52364 | 108.018 | 0.204 | 66.314 | 0.423 | 1.35 |
| 52365 | 63.207 | 0.119 | 142.985 | 0.913 | 0.03 |
| 52368 | 18.075 | 0.034 | 29.790 | 0.190 | HIGH |
| 52369 | 98.045 | 0.185 | 8.867 | 0.057 | 4.22 |
| 52370 | 49.533 | 0.093 | 45.959 | 0.293 | 3.75 |
| 52371 | 69.654 | 0.131 | 47.360 | 0.302 | 2.93 |
| 52372 | 65.718 | 0.124 | 121.186 | 0.774 | 0.31 |
| 52375 | -14.878 | 0.028 | 37.237 | 0.238 | 8.17 |
| 52376 | -13.571 | 0.026 | 14.953 | 0.095 | HIGH |
| 52377 | 46.832 | 0.088 | 42.287 | 0.270 | 4.28 |
| 52378 | 5.714 | 0.011 | 34.189 | 0.218 | HIGH |
| 52379 | 9.366 | 0.018 | 77.958 | 0.498 | 2.20 |
| 52383 | -224.574 | 0.424 | 14.799 | 0.095 | 1.27 |
| 52384 | -126.586 | 0.239 | 12.979 | 0.083 | 2.97 |
| 52385 | -67.034 | 0.126 | 21.958 | 0.140 | 5.30 |
| 52386 | -26.619 | 0.050 | 23.190 | 0.148 | HIGH |
| 52387 | -47.091 | 0.089 | 48.758 | 0.311 | 3.57 |
| 52390 | -126.739 | 0.239 | 0.473 | 0.003 | 3.18 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52391 | -117.233 | 0.221 | 1.976 | 0.013 | 3.51 |
| 52392 | -188.854 | 0.356 | 11.941 | 0.076 | 1.72 |
| 52393 | -61.665 | 0.116 | 9.610 | 0.061 | 7.07 |
| 52394 | -80.983 | 0.153 | 26.039 | 0.166 | 4.10 |
| 52396 | -232.691 | 0.439 | 10.231 | 0.065 | 1.23 |
| 52397 | -209.488 | 0.395 | 1.599 | 0.010 | 1.53 |
| 52398 | -192.934 | 0.364 | 1.774 | 0.011 | 1.74 |
| 52399 | -57.523 | 0.109 | 4.305 | 0.027 | 8.06 |
| 52400 | -172.031 | 0.325 | 13.877 | 0.089 | 1.95 |
| 52401 | -269.403 | 0.508 | 20.427 | 0.130 | 0.86 |
| 52402 | -257.838 | 0.486 | 9.755 | 0.062 | 1.02 |
| 52403 | -257.273 | 0.485 | 1.365 | 0.009 | 1.06 |
| 52404 | -254.348 | 0.480 | 1.255 | 0.008 | 1.08 |
| 52405 | -79.173 | 0.149 | 28.649 | 0.183 | 3.99 |
| 52406 | -263.177 | 0.497 | 35.314 | 0.226 | 0.75 |
| 52407 | -247.341 | 0.467 | 9.909 | 0.063 | 1.11 |
| 52408 | -264.730 | 0.499 | 1.920 | 0.012 | 1.00 |
| 52409 | -277.666 | 0.524 | 6.168 | 0.039 | 0.90 |
| 52410 | -259.492 | 0.490 | 31.109 | 0.199 | 0.82 |
| 52411 | -261.836 | 0.494 | 4.447 | 0.028 | 1.02 |
| 52412 | -238.397 | 0.450 | 4.779 | 0.031 | 1.21 |
| 52413 | -231.732 | 0.437 | 15.431 | 0.099 | 1.20 |
| 52414 | -263.009 | 0.496 | 7.566 | 0.048 | 1.00 |
| 52415 | -153.572 | 0.290 | 7.002 | 0.045 | 2.40 |
| 52425 | 354.349 | 0.669 | 10.948 | 0.070 | 0.47 |
| 52426 | -226.476 | 0.427 | 2.641 | 0.017 | 1.34 |
| 52427 | 222.557 | 0.420 | 4.471 | 0.029 | 1.37 |
| 52443 | 190.129 | 0.359 | 4.648 | 0.030 | 1.77 |
| 52444 | 72.960 | 0.138 | 2.318 | 0.015 | 6.23 |
| 52445 | -251.862 | 0.475 | 2.885 | 0.018 | 1.10 |
| 52446 | 59.625 | 0.112 | 3.611 | 0.023 | 7.78 |
| 52447 | -120.655 | 0.228 | 10.742 | 0.069 | 3.22 |
| 52463 | 161.758 | 0.305 | 6.671 | 0.043 | 2.23 |
| 52464 | 231.369 | 0.437 | 7.058 | 0.045 | 1.27 |
| 52465 | -88.796 | 0.168 | 12.664 | 0.081 | 4.56 |
| 53301 | -185.790 | 0.351 | 2.476 | 0.016 | 1.85 |
| 53302 | 151.504 | 0.286 | 2.344 | 0.015 | 2.49 |
| 53303 | 185.773 | 0.351 | 4.463 | 0.028 | 1.84 |
| 53304 | -290.477 | 0.548 | 2.232 | 0.014 | 0.82 |
| 53305 | -410.710 | 0.775 | 3.210 | 0.021 | 0.29 |
| 53306 | 19.926 | 0.038 | 5.504 | 0.035 | HIGH |
| 53307 | -527.384 | 0.995 | 8.320 | 0.053 | 0.00 |
| 53308 | 92.099 | 0.174 | 4.642 | 0.030 | 4.69 |
| 53313 | -154.839 | 0.292 | 3.182 | 0.020 | 2.41 |
| 53314 | -251.089 | 0.474 | 2.275 | 0.015 | 1.11 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53319 | -466.494 | 0.880 | 2.585 | 0.017 | 0.14 |
| 53320 | -407.241 | 0.768 | 4.840 | 0.031 | 0.30 |
| 53321 | -225.983 | 0.426 | 3.248 | 0.021 | 1.34 |
| 53322 | -255.881 | 0.483 | 1.332 | 0.009 | 1.07 |
| 53323 | -232.530 | 0.439 | 0.453 | 0.003 | 1.28 |
| 53324 | -132.950 | 0.251 | 1.723 | 0.011 | 2.98 |
| 53327 | -289.779 | 0.547 | 1.259 | 0.008 | 0.83 |
| 53328 | -153.850 | 0.290 | 2.219 | 0.014 | 2.44 |
| 53329 | -406.353 | 0.767 | 1.971 | 0.013 | 0.30 |
| 53330 | -464.634 | 0.877 | 4.799 | 0.031 | 0.14 |
| 53331 | -231.530 | 0.437 | 2.656 | 0.017 | 1.28 |
| 53332 | -203.614 | 0.384 | 1.665 | 0.011 | 1.60 |
| 53333 | -294.548 | 0.556 | 1.746 | 0.011 | 0.80. |
| 53334 | -239.875 | 0.453 | 1.554 | 0.010 | 1.21 |
| 53338 | -359.278 | 0.678 | 3.009 | 0.019 | 0.47 |
| 53339 | -293.335 | 0.553 | 1.692 | 0.011 | 0.81 |
| 53340 | -377.011 | 0.711 | 2.156 | 0.014 | 0.40 |
| 53341 | -416.442 | 0.786 | 3.263 | 0.021 | 0.27 |
| 53342 | -205.183 | 0.387 | 1.145 | 0.007 | 1.58 |
| 53343 | -151.031 | 0.285 | 1.518 | 0.010 | 2.51 |
| 53344 | -177.608 | 0.335 | 3.660 | 0.023 | 1.97 |
| 53345 | -278.345 | 0.525 | 5.511 | 0.035 | 0.89 |
| 53350 | -260.036 | 0.491 | 2.939 | 0.019 | 1.03 |
| 53351 | -267.803 | 0.505 | 1.289 | 0.008 | 0.98 |
| 53352 | -311.463 | 0.588 | 1.946 | 0.012 | 0.70 |
| 53353 | -349.971 | 0.660 | 1.899 | 0.012 | 0.51 |
| 53354 | -163.165 | 0.308 | 3.039 | 0.019 | 2.24 |
| 53355 | -125.798 | 0.237 | 1.858 | 0.012 | 3.21 |
| 53356 | -135.267 | 0.255 | 2.450 | 0.016 | 2.91 |
| 53357 | -111.972 | 0.211 | 9.250 | 0.059 | 3.58 |
| 53363 | -156.643 | 0.296 | 1.228 | 0.008 | 2.38 |
| 53364 | -200.951 | 0.379 | 0.812 | 0.005 | 1.64 |
| 53365 | -243.140 | 0.459 | 1.282 | 0.008 | 1.18 |
| 53366 | -279.531 | 0.527 | 1.680 | 0.011 | 0.89 |
| 53367 | -105.189 | 0.198 | 19.049 | 0.122 | 3.47 |
| 53368 | -115.632 | 0.218 | 3.667 | 0.023 | 3.55 |
| 53369 | -121.138 | 0.229 | 0.899 | 0.006 | 3.37 |
| 53370 | -102.948 | 0.194 | 3.776 | 0.024 | 4.11 |
| 53371 | 26.474 | 0.050 | 12.475 | 0.080 | HIGH |
| 53376 | -78.734 | 0.149 | 1.302 | 0.008 | 5.72 |
| 53377 | -113.197 | 0.214 | 1.015 | 0.006 | 3.68 |
| 53378 | -150.237 | 0.283 | 0.478 | 0.003 | 2.53 |
| 53379 | -184.063 | 0.347 | 0.737 | 0.005 | 1.88 |
| 53380 | -214.597 | 0.405 | 1.866 | 0.012 | 1.47 |
| 53382 | -62.872 | 0.119 | 8.297 | 0.053 | 7.03 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53383 | -71.984 | 0.136 | 2.231 | 0.014 | 6.33 |
| 53384 | -71.055 | 0.134 | 0.915 | 0.006 | 6.45 |
| 53385 | -16.427 | 0.031 | 1.840 | 0.012 | HIGH |
| 53386 | -61.331 | 0.116 | 8.157 | 0.052 | 7.24 |
| 53390 | -47.188 | 0.089 | 1.710 | 0.011 | HIGH |
| 53391 | -45.593 | 0.086 | 0.433 | 0.003 | HIGH |
| 53392 | -75.576 | 0.143 | 0.308 | 0.002 | 6.01 |
| 53393 | -98.842 | 0.186 | 0.162 | 0.001 | 4.36 |
| 53394 | -127.031 | 0.240 | 0.194 | 0.001 | 3.17 |
| 53395 | -151.146 | 0.285 | 3.332 | 0.021 | 2.49 |
| 53397 | -356.012 | 0.672 | 22.196 | 0.142 | 0.42 |
| 53398 | -272.302 | 0.514 | 4.453 | 0.028 | 0.94 |
| 53399 | -216.572 | 0.409 | 1.490 | 0.010 | 1.45 |
| 53400 | -172.543 | 0.326 | 1.102 | 0.007 | 2.07 |
| 53401 | -105.222 | 0.199 | 0.110 | 0.001 | 4.04 |
| 53402 | 1.986 | 0.004 | 0.747 | 0.005 | HIGH |
| 53403 | 202.721 | 0.382 | 3.067 | 0.020 | 1.61 |
| 53406 | -268.863 | 0.507 | 8.395 | 0.054 | 0.95 |
| 53407 | -294.135 | 0.555 | 3.264 | 0.021 | 0.80 |
| 53408 | -288.408 | 0.544 | 2.815 | 0.018 | 0.83 |
| 53409 | -278.742 | 0.526 | 2.738 | 0.017 | 0.90 |
| 53410 | -252.081 | 0.476 | 2.345 | 0.015 | 1.10 |
| 53411 | -161.410 | 0.305 | 0.846 | 0.005 | 2.28 |
| 53412 | -150.566 | 0.284 | 1.679 | 0.011 | 2.52 |
| 53413 | -44.890 | 0.085 | 10.359 | 0.066 | 9.72 |
| 53415 | -301.527 | 0.569 | 1.112 | 0.007 | 0.76 |
| 53416 | -340.600 | 0.643 | 2.785 | 0.018 | 0.55 |
| 53417 | -358.472 | 0.676 | 4.420 | 0.028 | 0.47 |
| 53418 | -381.359 | 0.720 | 4.566 | 0.029 | 0.39 |
| 53419 | -280.761 | 0.530 | 2.630 | 0.017 | 0.88 |
| 53420 | -101.834 | 0.192 | 0.111 | 0.001 | 4.20 |
| 53421 | -65.176 | 0.123 | 3.262 | 0.021 | 7.06 |
| 53424 | -348.202 | 0.657 | 2.489 | 0.016 | 0.52 |
| 53425 | -438.625 | 0.828 | 6.828 | 0.044 | 0.20 |
| 53426 | -566.993 | 1.070 | 7.559 | 0.048 | -0.07 |
| 53432 | -372.553 | 0.703 | 7.247 | 0.046 | 0.41 |
| 53433 | -433.132 | 0.817 | 12.251 | 0.078 | 0.21 |
| 53440 | -316.924 | 0.598 | 26.900 | 0.172 | 0.55 |
| 53450 | -154.823 | 0.292 | 81.144 | 0.518 | 0.64 |
| 53455 | -234.695 | 0.443 | 5.376 | 0.034 | 1.24 |
| 53456 | -301.862 | 0.570 | 0.769 | 0.005 | 0.76 |
| 53457 | -610.291 | 1.151 | 14.648 | 0.094 | -0.14 |
| 53463 | -32.820 | 0.062 | 1.967 | 0.013 | HIGH |
| 53464 | -87.224 | 0.165 | 1.349 | 0.009 | 5.07 |
| 53465 | 126.265 | 0.238 | 4.061 | 0.026 | 3.17 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53467 | -26.425 | 0.050 | 13.405 | 0.086 | HIGH |
| 53470 | 30.251 | 0.057 | 1.921 | 0.012 | HIGH |
| 53471 | 38.322 | 0.072 | 1.795 | 0.011 | HIGH |
| 53472 | 121.878 | 0.230 | 2.299 | 0.015 | 3.34 |
| 53473 | 120.720 | 0.228 | 6.625 | 0.042 | 3.32 |
| 53474 | -18.577 | 0.035 | 8.801 | 0.056 | HIGH |
| 53475 | -3.787 | 0.007 | 2.450 | 0.016 | HIGH |
| 53476 | 30.744 | 0.058 | 1.875 | 0.012 | HIGH |
| 53477 | 75.124 | 0.142 | 1.795 | 0.011 | 6.04 |
| 53478 | 118.863 | 0.224 | 1.681 | 0.011 | 3.45 |
| 53479 | 110.791 | 0.209 | 7.081 | 0.045 | 3.68 |
| 53480 | -4.160 | 0.008 | 6.513 | 0.042 | HIGH |
| 53481 | 29.626 | 0.056 | 3.364 | 0.021 | HIGH |
| 53482 | 66.793 | 0.126 | 2.266 | 0.014 | 6.90 |
| 53483 | 109.079 | 0.206 | 1.293 | 0.008 | 3.85 |
| 53484 | 104.467 | 0.197 | 5.855 | 0.037 | 3.99 |
| 53485 | 24.647 | 0.047 | 5.198 | 0.033 | HIGH |
| 53486 | 51.306 | 0.097 | 3.620 | 0.023 | 9.19 |
| 53487 | 85.281 | 0.161 | 1.659 | 0.011 | 5.20 |
| 53488 | 86.475 | 0.163 | 4.569 | 0.029 | 5.05 |
| 53489 | 28.382 | 0.054 | 5.130 | 0.033 | HIGH |
| 53490 | 55.650 | 0.105 | 3.221 | 0.021 | 8.42 |
| 53491 | 59.435 | 0.112 | 3.774 | 0.024 | 7.80 |
| 53492 | 19.755 | 0.037 | 5.578 | 0.036 | HIGH |
| 53493 | 20.559 | 0.039 | 3.808 | 0.024 | HIGH |
| 53494 | -45.383 | 0.086 | 5.061 | 0.032 | HIGH |
| 53499 | -53.691 | 0.101 | 3.533 | 0.023 | 8.74 |
| 53500 | -105.268 | 0.199 | 2.000 | 0.013 | 4.02 |
| 53501 | -58.309 | 0.110 | 0.626 | 0.004 | 8.08 |
| 53502 | -25.981 | 0.049 | 0.663 | 0.004 | HIGH |
| 53503 | 3.721 | 0.007 | 1.127 | 0.007 | HIGH |
| 53504 | 31.534 | 0.059 | 1.249 | 0.008 | HIGH |
| 53505 | 58.322 | 0.110 | 1.202 | 0.008 | 8.07 |
| 53506 | 85.349 | 0.161 | 2.903 | 0.019 | 5.17 |
| 53509 | -434.477 | 0.820 | 9.147 | 0.058 | 0.21 |
| 53510 | -208.081 | 0.393 | 2.664 | 0.017 | 1.54 |
| 53511 | -124.393 | 0.235 | 0.922 | 0.006 | 3.26 |
| 53512 | -80.536 | 0.152 | 0.981 | 0.006 | 5.57 |
| 53513 | -38.152 | 0.072 | 1.500 | 0.010 | HIGH |
| 53514 | -4.085 | 0.008 | 1.794 | 0.011 | HIGH |
| 53515 | 25.799 | 0.049 | 2.547 | 0.016 | HIGH |
| 53518 | -161.634 | 0.305 | 6.724 | 0.043 | 2.24 |
| 53519 | -92.595 | 0.175 | 4.330 | 0.028 | 4.66 |
| 53520 | -141.758 | 0.267 | 2.049 | 0.013 | 2.73 |
| 53521 | -133.679 | 0.252 | 1.179 | 0.008 | 2.96 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53522 | -89.168 | 0.168 | 1.758 | 0.011 | 4.93 |
| 53523 | -51.873 | 0.098 | 2.503 | 0.016 | 9.14 |
| 53524 | -25.133 | 0.047 | 2.868 | 0.018 | HIGH |
| 53530 | -109.989 | 0.208 | 1.473 | 0.009 | 3.81 |
| 53531 | -75.304 | 0.142 | 3.600 | 0.023 | 5.97 |
| 53532 | -43.643 | 0.082 | 3.849 | 0.025 | HIGH |
| 53539 | -45.400 | 0.086 | 4.626 | 0.030 | HIGH |
| 53540 | -38.421 | 0.072 | 5.552 | 0.035 | HIGH |
| 53550 | 6.610 | 0.012 | 12.352 | 0.079 | HIGH |
| 53553 | 208.302 | 0.393 | 7.023 | 0.045 | 1.52 |
| 53554 | 238.793 | 0.451 | 1.488 | 0.010 | 1.22 |
| 53559 | -7.667 | 0.014 | 27.585 | 0.176 | HIGH |
| 53561 | 368.648 | 0.696 | 4.812 | 0.031 | 0.43. |
| 53562 | 370.669 | 0.699 | 3.828 | 0.024 | 0.43 |
| 53563 | 476.657 | 0.899 | 3.268 | 0.021 | 0.11 |
| 53568 | 294.656 | 0.556 | 4.797 | 0.031 | 0.79 |
| 53569 | 377.285 | 0.712 | 4.671 | 0.030 | 0.40 |
| 53570 | 468.214 | 0.883 | 2.491 | 0.016 | 0.13 |
| 53571 | 568.437 | 1.073 | 5.661 | 0.036 | -0.07 |
| 53574 | 62.554 | 0.118 | 7.176 | 0.046 | 7.16 |
| 53575 | 348.988 | 0.658 | 8.165 | 0.052 | 0.51 |
| 53576 | 382.039 | 0.721 | 3.657 | 0.023 | 0.38 |
| 53577 | 408.944 | 0.772 | 3.012 | 0.019 | 0.29 |
| 53578 | 386.172 | 0.729 | 5.614 | 0.036 | 0.37 |
| 53579 | 257.900 | 0.487 | 6.351 | 0.041 | 1.04 |
| 53580 | 136.051 | 0.257 | 8.790 | 0.056 | 2.80 |
| 53581 | 349.902 | 0.660 | 7.344 | 0.047 | 0.50 |
| 53582 | 356.187 | 0.672 | 1.787 | 0.011 | 0.49 |
| 53583 | 366.073 | 0.691 | 4.426 | 0.028 | 0.44 |
| 53584 | 348.453 | 0.657 | 7.140 | 0.046 | 0.51 |
| 53585 | 253.839 | 0.479 | 7.965 | 0.051 | 1.06 |
| 53586 | 316.276 | 0.597 | 4.347 | 0.028 | 0.67 |
| 53587 | 332.419 | 0.627 | 0.805 | 0.005 | 0.59 |
| 53588 | 338.385 | 0.638 | 6.641 | 0.042 | 0.56 |
| 53589 | 299.439 | 0.565 | 7.374 | 0.047 | 0.76 |
| 53590 | 245.456 | 0.463 | 2.944 | 0.019 | 1.15 |
| 53591 | 295.733 | 0.558 | 6.521 | 0.042 | 0.78 |
| 53592 | 270.819 | 0.511 | 9.826 | 0.063 | 0.93 |
| 53594 | 318.944 | 0.602 | 27.895 | 0.178 | 0.54 |
| 62201 | -135.842 | 0.256 | 17.630 | 0.113 | 2.59 |
| 62202 | 67.780 | 0.128 | 3.930 | 0.025 | 6.72 |
| 62203 | 7.448 | 0.014 | 1.840 | 0.012 | HIGH |
| 62204 | -87.941 | 0.166 | 5.056 | 0.032 | 4.94 |
| 62205 | -128.001 | 0.242 | 2.155 | 0.014 | 3.13 |
| 62206 | 42.730 | 0.081 | 2.836 | 0.018 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62207 | -134.464 | 0.254 | 2.136 | 0.014 | 2.93 |
| 62208 | 23.463 | 0.044 | 1.575 | 0.010 | HIGH |
| 62215 | -172.272 | 0.325 | 7.107 | 0.045 | 2.03 |
| 62216 | -105.199 | 0.198 | 3.678 | 0.023 | 4.00 |
| 62222 | -132.552 | 0.250 | 2.323 | 0.015 | 2.99 |
| 62223 | -106.731 | 0.201 | 1.817 | 0.012 | 3.96 |
| 62224 | -126.572 | 0.239 | 10.620 | 0.068 | 3.04 |
| 62225 | -113.180 | 0.214 | 5.607 | 0.036 | 3.62 |
| 62226 | -84.666 | 0.160 | 2.794 | 0.018 | 5.23 |
| 62227 | -70.043 | 0.132 | 2.827 | 0.018 | 6.52 |
| 62228 | -57.148 | 0.108 | 2.022 | 0.013 | 8.23 |
| 62229 | -57.574 | 0.109 | 0.859 | 0.005 | 8.20 |
| 62230 | -70.877 | 0.134 | 1.295 | 0.008 | 6.47 |
| 62231 | -85.699 | 0.162 | 3.308 | 0.021 | 5.14 |
| 62232 | -109.771 | 0.207 | 4.659 | 0.030 | 3.78 |
| 62233 | -102.437 | 0.193 | 2.986 | 0.019 | 4.15 |
| 62234 | -103.193 | 0.195 | 10.985 | 0.070 | 3.90 |
| 62235 | -1.329 | 0.003 | 11.060 | 0.071 | HIGH |
| 62236 | -43.725 | 0.082 | 6.113 | 0.039 | HIGH |
| 62237 | -48.414 | 0.091 | 3.256 | 0.021 | 9.81 |
| 62238 | -46.598 | 0.088 | 4.442 | 0.028 | HIGH |
| 62239 | -41.592 | 0.078 | 0.671 | 0.004 | HIGH |
| 62240 | -46.865 | 0.088 | 1.216 | 0.008 | HIGH |
| 62241 | -57.740 | 0.109 | 7.190 | 0.046 | 7.81 |
| 62242 | -74.711 | 0.141 | 5.996 | 0.038 | 5.93 |
| 62243 | -83.099 | 0.157 | 9.021 | 0.058 | 5.11 |
| 62244 | -76.843 | 0.145 | 0.886 | 0.006 | 5.89 |
| 62245 | 35.635 | 0.067 | 39.087 | 0.250 | 5.44 |
| 62246 | 14.900 | 0.028 | 9.695 | 0.062 | HIGH |
| 62247 | 18.216 | 0.034 | 12.649 | 0.081 | HIGH |
| 62248 | -12.752 | 0.024 | 3.381 | 0.022 | HIGH |
| 62249 | -19.482 | 0.037 | 3.468 | 0.022 | HIGH |
| 62250 | -28.704 | 0.054 | 3.368 | 0.022 | HIGH |
| 62251 | -23.496 | 0.044 | 0.834 | 0.005 | HIGH |
| 62252 | -31.590 | 0.060 | 3.242 | 0.021 | HIGH |
| 62253 | -43.933 | 0.083 | 4.273 | 0.027 | HIGH |
| 62254 | -51.248 | 0.097 | 7.439 | 0.048 | 8.85 |
| 62255 | -63.249 | 0.119 | 1.259 | 0.008 | 7.36 |
| 62256 | -72.292 | 0.136 | 2.813 | 0.018 | 6.28 |
| 62257 | 71.883 | 0.136 | 63.195 | 0.404 | 1.94 |
| 62258 | 49.095 | 0.093 | 33.786 | 0.216 | 5.21 |
| 62259 | 57.371 | 0.108 | 21.617 | 0.138 | 6.17 |
| 62260 | 27.559 | 0.052 | 1.942 | 0.012 | HIGH |
| 62261 | 13.334 | 0.025 | 2.565 | 0.016 | HIGH |
| 62262 | 10.078 | 0.019 | 2.850 | 0.018 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62263 | -6.964 | 0.013 | 0.152 | 0.001 | HIGH |
| 62264 | -11.192 | 0.021 | 1.747 | 0.011 | HIGH |
| 62265 | -19.687 | 0.037 | 1.751 | 0.011 | HIGH |
| 62266 | -31.614 | 0.060 | 2.720 | 0.017 | HIGH |
| 62267 | -46.246 | 0.087 | 1.897 | 0.012 | HIGH |
| 62268 | -49.101 | 0.093 | 1.290 | 0.008 | 9.77 |
| 62269 | -77.768 | 0.147 | 6.487 | 0.041 | 5.64 |
| 62270 | -53.299 | 0.101 | 7.636 | 0.049 | 8.47 |
| 62271 | -50.508 | 0.095 | 72.843 | 0.465 | 1.80 |
| 62272 | -1.640 | 0.003 | 10.171 | 0.065 | HIGH |
| 62273 | -23.363 | 0.044 | 3.556 | 0.023 | HIGH |
| 62274 | -12.469 | 0.024 | 6.265 | 0.040 | HIGH |
| 62275 | -2.213 | 0.004 | 5.953 | 0.038 | HIGH |
| 62278 | -14.200 | 0.027 | 32.817 | 0.210 | 9.91 |
| 62279 | 4.491 | 0.008 | 49.172 | 0.314 | 6.13 |
| 62280 | -48.845 | 0.092 | 3.641 | 0.023 | 9.69 |
| 62281 | -7.035 | 0.013 | 3.879 | 0.025 | HIGH |
| 62282 | -39.579 | 0.075 | 5.633 | 0.036 | HIGH |
| 62283 | -23.898 | 0.045 | 6.102 | 0.039 | HIGH |
| 62286 | -20.358 | 0.038 | 22.252 | 0.142 | HIGH |
| 62287 | -52.336 | 0.099 | 15.649 | 0.100 | 7.58 |
| 62288 | -21.616 | 0.041 | 4.780 | 0.031 | HIGH |
| 62289 | -17.162 | 0.032 | 4.267 | 0.027 | HIGH |
| 62290 | -33.348 | 0.063 | 12.613 | 0.081 | HIGH |
| 62293 | -31.810 | 0.060 | 6.631 | 0.042 | HIGH |
| 62294 | -16.602 | 0.031 | 6.860 | 0.044 | HIGH |
| 62295 | -10.032 | 0.019 | 2.732 | 0.017 | HIGH |
| 62296 | -11.923 | 0.022 | 4.542 | 0.029 | HIGH |
| 62297 | -24.971 | 0.047 | 7.857 | 0.050 | HIGH |
| 62300 | -7.179 | 0.014 | 3.170 | 0.020 | HIGH |
| 62301 | -3.329 | 0.006 | 2.843 | 0.018 | HIGH |
| 62302 | 5.778 | 0.011 | 4.271 | 0.027 | HIGH |
| 62303 | 0.462 | 0.001 | 4.412 | 0.028 | HIGH |
| 62304 | 1.622 | 0.003 | 6.295 | 0.040 | HIGH |
| 62308 | -5.816 | 0.011 | 0.776 | 0.005 | HIGH |
| 62309 | 21.917 | 0.041 | 0.604 | 0.004 | HIGH |
| 62310 | 18.031 | 0.034 | 1.817 | 0.012 | HIGH |
| 62311 | 22.665 | 0.043 | 4.100 | 0.026 | HIGH |
| 62312 | 33.522 | 0.063 | 4.200 | 0.027 | HIGH |
| 62316 | 19.392 | 0.037 | 1.873 | 0.012 | HIGH |
| 62317 | 24.832 | 0.047 | 1.215 | 0.008 | HIGH |
| 62318 | 32.841 | 0.062 | 1.564 | 0.010 | HIGH |
| 62319 | 43.634 | 0.082 | 2.672 | 0.017 | HIGH |
| 62320 | 55.429 | 0.105 | 1.921 | 0.012 | 8.52 |
| 62323 | 25.234 | 0.048 | 2.409 | 0.015 | HIGH |

S.S.51

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62324 | 34.105 | 0.064 | 1.656 | 0.011 | HIGH |
| 62325 | 46.317 | 0.087 | 2.258 | 0.014 | HIGH |
| 62326 | 61.849 | 0.117 | 5.040 | 0.032 | 7.39 |
| 62327 | 73.971 | 0.140 | 6.385 | 0.041 | 5.98 |
| 62329 | 27.104 | 0.051 | 4.962 | 0.032 | HIGH |
| 62330 | 39.174 | 0.074 | 4.246 | 0.027 | HIGH |
| 62331 | 47.193 | 0.089 | 1.547 | 0.010 | HIGH |
| 62332 | 60.197 | 0.114 | 5.271 | 0.034 | 7.60 |
| 62333 | 53.577 | 0.101 | 2.123 | 0.014 | 8.84 |
| 62334 | 29.540 | 0.056 | 7.520 | 0.048 | HIGH |
| 62335 | 44.167 | 0.083 | 3.381 | 0.022 | HIGH |
| 62336 | 25.766 | 0.049 | 0.120 | 0.001 | HIGH |
| 62337 | 56.211 | 0.106 | 2.237 | 0.014 | 8.38 |
| 62338 | 22.637 | 0.043 | 7.658 | 0.049 | HIGH |
| 62339 | 24.969 | 0.047 | 2.096 | 0.013 | HIGH |
| 62340 | 33.003 | 0.062 | 1.346 | 0.009 | HIGH |
| 62341 | -14.123 | 0.027 | 10.963 | 0.070 | HIGH |
| 62342 | 13.656 | 0.026 | 3.925 | 0.025 | HIGH |
| 62343 | -17.359 | 0.033 | 12.251 | 0.078 | HIGH |
| 62346 | 82.705 | 0.156 | 3.193 | 0.020 | 5.36 |
| 62347 | -15.538 | 0.029 | 4.422 | 0.028 | HIGH |
| 62348 | -12.197 | 0.023 | 3.369 | 0.022 | HIGH |
| 62349 | -10.251 | 0.019 | 1.006 | 0.006 | HIGH |
| 62350 | -1.163 | 0.002 | 1.643 | 0.010 | HIGH |
| 62351 | 25.547 | 0.048 | 6.564 | 0.042 | HIGH |
| 62353 | -18.411 | 0.035 | 3.106 | 0.020 | HIGH |
| 62354 | -79.002 | 0.149 | 10.970 | 0.070 | 5.31 |
| 62355 | -46.923 | 0.089 | 5.409 | 0.035 | 9.95 |
| 62356 | -37.376 | 0.071 | 5.683 | 0.036 | HIGH |
| 62357 | -25.817 | 0.049 | 2.578 | 0.016 | HIGH |
| 62358 | -21.852 | 0.041 | 9.817 | 0.063 | HIGH |
| 62361 | -87.328 | 0.165 | 4.020 | 0.026 | 5.01 |
| 62362 | -69.498 | 0.131 | 7.894 | 0.050 | 6.33 |
| 62363 | -49.068 | 0.093 | 3.953 | 0.025 | 9.62 |
| 62364 | -40.091 | 0.076 | 9.771 | 0.062 | HIGH |
| 62365 | -23.733 | 0.045 | 9.029 | 0.058 | HIGH |
| 62368 | -83.764 | 0.158 | 3.284 | 0.021 | 5.28 |
| 62369 | -68.236 | 0.129 | 2.962 | 0.019 | 6.71 |
| 62370 | -57.166 | 0.108 | 3.786 | 0.024 | 8.15 |
| 62371 | -44.584 | 0.084 | 1.606 | 0.010 | HIGH |
| 62372 | -31.245 | 0.059 | 6.646 | 0.042 | HIGH |
| 62375 | -57.964 | 0.109 | 4.156 | 0.027 | 8.00 |
| 62376 | -47.263 | 0.089 | 1.159 | 0.007 | HIGH |
| 62377 | -50.582 | 0.095 | 2.153 | 0.014 | 9.42 |
| 62378 | -42.341 | 0.080 | 0.669 | 0.004 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62379 | -32.894 | 0.062 | 4.447 | 0.028 | HIGH |
| 62383 | -11.034 | 0.021 | 5.744 | 0.037 | HIGH |
| 62384 | -25.483 | 0.048 | 1.458 | 0.009 | HIGH |
| 62385 | -29.717 | 0.056 | 3.849 | 0.025 | HIGH |
| 62386 | -27.203 | 0.051 | 0.657 | 0.004 | HIGH |
| 62387 | -27.434 | 0.052 | 3.828 | 0.024 | HIGH |
| 62390 | 1.784 | 0.003 | 0.196 | 0.001 | HIGH |
| 62391 | -8.672 | 0.016 | 1.966 | 0.013 | HIGH |
| 62392 | -10.179 | 0.019 | 1.788 | 0.011 | HIGH |
| 62393 | -0.700 | 0.001 | 2.740 | 0.017 | HIGH |
| 62394 | -26.525 | 0.050 | 4.537 | 0.029 | HIGH |
| 62396 | 5.770 | 0.011 | 2.788 | 0.018 | HIGH |
| 62397 | -14.664 | 0.028 | 4.865 | 0.031 | HIGH |
| 62398 | -9.510 | 0.018 | 5.034 | 0.032 | HIGH |
| 62399 | -2.446 | 0.005 | 2.894 | 0.018 | HIGH |
| 62400 | 0.620 | 0.001 | 3.722 | 0.024 | HIGH |
| 62401 | 1.188 | 0.002 | 1.766 | 0.011 | HIGH |
| 62402 | -74.811 | 0.141 | 4.648 | 0.030 | 5.98 |
| 62403 | -31.853 | 0.060 | 10.875 | 0.069 | HIGH |
| 62404 | -0.575 | 0.001 | 9.634 | 0.062 | HIGH |
| 62405 | 13.716 | 0.026 | 8.328 | 0.053 | HIGH |
| 62406 | -106.962 | 0.202 | 2.075 | 0.013 | 3.94 |
| 62407 | -52.215 | 0.099 | 17.914 | 0.114 | 7.26 |
| 62408 | -9.457 | 0.018 | 29.480 | 0.188 | HIGH |
| 62409 | 27.062 | 0.051 | 9.357 | 0.060 | HIGH |
| 62410 | -48.454 | 0.091 | 22.569 | 0.144 | 6.99 |
| 62411 | -43.480 | 0.082 | 45.258 | 0.289 | 4.10 |
| 62412 | -13.727 | 0.026 | 36.728 | 0.235 | 8.53 |
| 62413 | -2.151 | 0.004 | 110.038 | 0.703 | 0.84 |
| 62414 | 42.215 | 0.080 | 40.218 | 0.257 | 4.80 |
| 62415 | 2.801 | 0.005 | 37.550 | 0.240 | HIGH |
| 63301 | -320.131 | 0.604 | 2.738 | 0.017 | 0.65 |
| 63302 | -130.470 | 0.246 | 4.199 | 0.027 | 3.03 |
| 63303 | -46.829 | 0.088 | 3.503 | 0.022 | HIGH |
| 63304 | -142.994 | 0.270 | 1.850 | 0.012 | 2.70 |
| 63305 | -201.966 | 0.381 | 1.427 | 0.009 | 1.62 |
| 63306 | 94.291 | 0.178 | 0.801 | 0.005 | 4.62 |
| 63307 | -149.964 | 0.283 | 5.866 | 0.037 | 2.49 |
| 63308 | 70.635 | 0.133 | 3.324 | 0.021 | 6.44 |
| 63313 | -192.862 | 0.364 | 5.233 | 0.033 | 1.73 |
| 63314 | -227.488 | 0.429 | 1.246 | 0.008 | 1.33 |
| 63319 | -163.723 | 0.309 | 2.407 | 0.015 | 2.23 |
| 63320 | -71.569 | 0.135 | 1.303 | 0.008 | 6.39 |
| 63321 | -163.735 | 0.309 | 6.247 | 0.040 | 2.20 |
| 63322 | -193.116 | 0.364 | 1.791 | 0.011 | 1.74 |

S.S.53

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63323 | -88.269 | 0.167 | 3.588 | 0.023 | 4.96 |
| 63324 | -234.977 | 0.443 | 5.040 | 0.032 | 1.24 |
| 63327 | -61.461 | 0.116 | 1.207 | 0.008 | 7.61 |
| 63328 | -114.654 | 0.216 | 1.440 | 0.009 | 3.62 |
| 63329 | -126.551 | 0.239 | 1.433 | 0.009 | 3.18 |
| 63330 | -93.102 | 0.176 | 0.337 | 0.002 | 4.69 |
| 63331 | -150.233 | 0.283 | 5.723 | 0.037 | 2.49 |
| 63332 | -181.868 | 0.343 | 3.335 | 0.021 | 1.90 |
| 63333 | -141.790 | 0.268 | 4.268 | 0.027 | 2.71 |
| 63334 | -236.684 | 0.447 | 13.443 | 0.086 | 1.17 |
| 63338 | -124.720 | 0.235 | 2.188 | 0.014 | 3.24 |
| 63339 | -143.315 | 0.270 | 1.234 | 0.008 | 2.70 |
| 63340 | -76.791 | 0.145 | 1.089 | 0.007 | 5.89 |
| 63341 | -74.935 | 0.141 | 0.477 | 0.003 | 6.07 |
| 63342 | -125.056 | 0.236 | 4.399 | 0.028 | 3.20 |
| 63343 | -156.343 | 0.295 | 3.910 | 0.025 | 2.37 |
| 63344 | -148.926 | 0.281 | 4.694 | 0.030 | 2.53 |
| 63345 | -131.670 | 0.248 | 13.116 | 0.084 | 2.82 |
| 63350 | -145.276 | 0.274 | 1.248 | 0.008 | 2.65 |
| 63351 | -62.093 | 0.117 | 1.240 | 0.008 | 7.52 |
| 63352 | -31.673 | 0.060 | 0.904 | 0.006 | HIGH |
| 63353 | -44.596 | 0.084 | 0.152 | 0.001 | HIGH |
| 63354 | -98.530 | 0.186 | 3.300 | 0.021 | 4.35 |
| 63355 | -122.632 | 0.231 | 3.307 | 0.021 | 3.30 |
| 63356 | -113.934 | 0.215 | 1.890 | 0.012 | 3.64 |
| 63357 | -112.885 | 0.213 | 9.079 | 0.058 | 3.55 |
| 63363 | -34.723 | 0.066 | 2.162 | 0.014 | HIGH |
| 63364 | -32.246 | 0.061 | 1.435 | 0.009 | HIGH |
| 63365 | -4.566 | 0.009 | 0.827 | 0.005 | HIGH |
| 63366 | 5.732 | 0.011 | 3.770 | 0.024 | HIGH |
| 63367 | -83.741 | 0.158 | 2.137 | 0.014 | 5.31 |
| 63368 | -99.458 | 0.188 | 2.058 | 0.013 | 4.31 |
| 63369 | -87.088 | 0.164 | 1.357 | 0.009 | 5.08 |
| 63370 | -81.392 | 0.154 | 2.624 | 0.017 | 5.48 |
| 63371 | -113.542 | 0.214 | 6.373 | 0.041 | 3.59 |
| 63376 | 39.153 | 0.074 | 3.081 | 0.020 | HIGH |
| 63377 | -33.484 | 0.063 | 1.562 | 0.010 | HIGH |
| 63378 | -20.384 | 0.038 | 1.708 | 0.011 | HIGH |
| 63379 | 8.301 | 0.016 | 4.264 | 0.027 | HIGH |
| 63380 | 46.447 | 0.088 | 14.584 | 0.093 | 8.68 |
| 63381 | -97.212 | 0.183 | 2.478 | 0.016 | 4.43 |
| 63382 | -93.784 | 0.177 | 0.674 | 0.004 | 4.65 |
| 63383 | -75.743 | 0.143 | 0.642 | 0.004 | 5.99 |
| 63384 | -64.850 | 0.122 | 0.515 | 0.003 | 7.17 |
| 63385 | -63.962 | 0.121 | 0.736 | 0.005 | 7.28 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63386 | -61.353 | 0.116 | 3.562 | 0.023 | 7.54 |
| 63390 | -31.502 | 0.059 | 1.769 | 0.011 | HIGH |
| 63391 | -2.055 | 0.004 | 0.654 | 0.004 | HIGH |
| 63392 | -18.069 | 0.034 | 1.069 | 0.007 | HIGH |
| 63393 | 18.779 | 0.035 | 4.556 | 0.029 | HIGH |
| 63394 | 57.515 | 0.109 | 18.532 | 0.118 | 6.55 |
| 63396 | 131.513 | 0.248 | 1.646 | 0.011 | 3.02 |
| 63397 | 105.758 | 0.200 | 0.211 | 0.001 | 4.01 |
| 63398 | 88.402 | 0.167 | 0.516 | 0.003 | 4.99 |
| 63399 | 75.070 | 0.142 | 1.118 | 0.007 | 6.05 |
| 63400 | 62.201 | 0.117 | 1.331 | 0.008 | 7.50 |
| 63401 | 41.672 | 0.079 | 1.237 | 0.008 | HIGH |
| 63402 | 13.106 | 0.025 | 0.961 | 0.006 | HIGH |
| 63403 | 10.630 | 0.020 | 3.964 | 0.025 | HIGH |
| 63406 | 80.794 | 0.152 | 1.427 | 0.009 | 5.55 |
| 63407 | 72.682 | 0.137 | 0.416 | 0.003 | 6.29 |
| 63408 | 60.315 | 0.114 | 0.822 | 0.005 | 7.78 |
| 63409 | 51.594 | 0.097 | 2.061 | 0.013 | 9.22 |
| 63410 | 44.140 | 0.083 | 2.844 | 0.018 | HIGH |
| 63411 | 4.177 | 0.008 | 2.829 | 0.018 | HIGH |
| 63412 | -104.234 | 0.197 | 2.820 | 0.018 | 4.06 |
| 63413 | -254.115 | 0.479 | 3.688 | 0.024 | 1.08 |
| 63415 | 62.301 | 0.118 | 1.353 | 0.009 | 7.49 |
| 63416 | 61.283 | 0.116 | 1.317 | 0.008 | 7.63 |
| 63417 | 55.565 | 0.105 | 2.187 | 0.014 | 8.49 |
| 63418 | 54.445 | 0.103 | 3.287 | 0.021 | 8.63 |
| 63419 | 37.190 | 0.070 | 3.592 | 0.023 | HIGH |
| 63420 | 54.956 | 0.104 | 5.441 | 0.035 | 8.39 |
| 63421 | 59.445 | 0.112 | 2.377 | 0.015 | 7.86 |
| 63424 | 68.403 | 0.129 | 2.329 | 0.015 | 6.71 |
| 63425 | 77.741 | 0.147 | 2.748 | 0.018 | 5.78 |
| 63426 | 109.650 | 0.207 | 4.982 | 0.032 | 3.78 |
| 63432 | 75.328 | 0.142 | 4.755 | 0.030 | 5.93 |
| 63433 | 97.330 | 0.184 | 7.103 | 0.045 | 4.32 |
| 63440 | 54.657 | 0.103 | 10.842 | 0.069 | 7.89 |
| 63450 | -8.627 | 0.016 | 14.700 | 0.094 | HIGH |
| 63455 | 84.783 | 0.160 | 0.783 | 0.005 | 5.25 |
| 63456 | 84.037 | 0.159 | 0.889 | 0.006 | 5.30 |
| 63457 | -107.693 | 0.203 | 5.689 | 0.036 | 3.85 |
| 63463 | 261.839 | 0.494 | 0.949 | 0.006 | 1.02 |
| 63464 | 192.426 | 0.363 | 0.652 | 0.004 | 1.75 |
| 63465 | 185.319 | 0.350 | 0.788 | 0.005 | 1.86 |
| 63467 | 42.993 | 0.081 | 3.758 | 0.024 | HIGH |
| 63470 | 361.485 | 0.682 | 2.378 | 0.015 | 0.46 |
| 63471 | 278.960 | 0.526 | 0.406 | 0.003 | 0.90 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63472 | 212.732 | 0.401 | 0.641 | 0.004 | 1.49 |
| 63473 | 148.958 | 0.281 | 2.480 | 0.016 | 2.55 |
| 63474 | 107.975 | 0.204 | 6.911 | 0.044 | 3.81 |
| 63475 | 186.018 | 0.351 | 3.655 | 0.023 | 1.84 |
| 63476 | 258.248 | 0.487 | 2.900 | 0.019 | 1.05 |
| 63477 | 255.813 | 0.483 | 1.161 | 0.007 | 1.07 |
| 63478 | 225.526 | 0.426 | 0.529 | 0.003 | 1.35 |
| 63479 | 194.509 | 0.367 | 1.656 | 0.011 | 1.72 |
| 63480 | 212.812 | 0.402 | 6.763 | 0.043 | 1.47 |
| 63481 | 261.174 | 0.493 | 5.073 | 0.032 | 1.02 |
| 63482 | 248.140 | 0.468 | 2.275 | 0.015 | 1.13 |
| 63483 | 220.600 | 0.416 | 0.179 | 0.001 | 1.40 |
| 63484 | 205.132 | 0.387 | 1.006 | 0.006 | 1.58 |
| 63485 | 253.424 | 0.478 | 7.325 | 0.047 | 1.07 |
| 63486 | 254.052 | 0.479 | 6.615 | 0.042 | 1.07 |
| 63487 | 225.516 | 0.426 | 1.560 | 0.010 | 1.35 |
| 63488 | 192.476 | 0.363 | 0.199 | 0.001 | 1.75 |
| 63489 | 233.865 | 0.441 | 16.437 | 0.105 | 1.17 |
| 63490 | 233.064 | 0.440 | 9.621 | 0.061 | 1.24 |
| 63491 | 177.883 | 0.336 | 5.501 | 0.035 | 1.95 |
| 63492 | 386.669 | 0.730 | 44.245 | 0.283 | 0.19 |
| 63499 | 45.144 | 0.085 | 4.656 | 0.030 | HIGH |
| 63500 | -71.980 | 0.136 | 0.469 | 0.003 | 6.36 |
| 63501 | -148.119 | 0.279 | 0.070 | 0.000 | 2.58 |
| 63502 | -206.248 | 0.389 | 0.705 | 0.005 | 1.57 |
| 63503 | -255.733 | 0.483 | 1.226 | 0.008 | 1.07 |
| 63504 | -329.556 | 0.622 | 4.131 | 0.026 | 0.60 |
| 63505 | -429.119 | 0.810 | 27.103 | 0.173 | 0.17 |
| 63509 | -158.818 | 0.300 | 3.592 | 0.023 | 2.32 |
| 63510 | -166.792 | 0.315 | 0.269 | 0.002 | 2.18 |
| 63511 | -232.753 | 0.439 | 0.722 | 0.005 | 1.28 |
| 63512 | -262.797 | 0.496 | 1.297 | 0.008 | 1.02 |
| 63513 | -290.119 | 0.547 | 1.432 | 0.009 | 0.83 |
| 63514 | -318.434 | 0.601 | 3.809 | 0.024 | 0.66 |
| 63515 | -323.187 | 0.610 | 11.673 | 0.075 | 0.61 |
| 63518 | -104.006 | 0.196 | 2.285 | 0.015 | 4.08 |
| 63519 | -100.076 | 0.189 | 1.219 | 0.008 | 4.29 |
| 63520 | -209.445 | 0.395 | 0.625 | 0.004 | 1.53 |
| 63521 | -292.108 | 0.551 | 1.437 | 0.009 | 0.81 |
| 63522 | -294.384 | 0.555 | 1.361 | 0.009 | 0.80 |
| 63523 | -307.178 | 0.580 | 1.049 | 0.007 | 0.72 |
| 63524 | -308.952 | 0.583 | 5.623 | 0.036 | 0.71 |
| 63530 | -390.402 | 0.737 | 2.501 | 0.016 | 0.36 |
| 63531 | -318.014 | 0.600 | 2.498 | 0.016 | 0.66 |
| 63532 | -272.200 | 0.514 | 2.853 | 0.018 | 0.94 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LIFTOFF LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63539 | -276.519 | 0.522 | 4.827 | 0.031 | 0.91 |
| 63540 | -236.421 | 0.446 | 4.844 | 0.031 | 1.23 |
| 63550 | -158.427 | 0.299 | 8.001 | 0.051 | 2.29 |
| 63553 | -238.792 | 0.451 | 4.876 | 0.031 | 1.21 |
| 63554 | -139.273 | 0.263 | 14.010 | 0.089 | 2.60 |
| 63559 | -69.421 | 0.131 | 33.087 | 0.211 | 4.08 |
| 63561 | -99.061 | 0.187 | 5.905 | 0.038 | 4.26 |
| 63562 | -198.709 | 0.375 | 6.025 | 0.038 | 1.64 |
| 63563 | -156.560 | 0.295 | 6.936 | 0.044 | 2.34 |
| 63568 | -149.702 | 0.282 | 7.156 | 0.046 | 2.48 |
| 63569 | -125.627 | 0.237 | 3.629 | 0.023 | 3.19 |
| 63570 | -165.253 | 0.312 | 6.440 | 0.041 | 2.17 |
| 63571 | -182.072 | 0.344 | 6.745 | 0.043 | 1.88 |
| 63574 | -8.520 | 0.016 | 2.471 | 0.016 | HIGH |
| 63575 | -132.716 | 0.250 | 8.614 | 0.055 | 2.90 |
| 63576 | -104.157 | 0.197 | 2.399 | 0.015 | 4.07 |
| 63577 | -111.264 | 0.210 | 4.479 | 0.029 | 3.72 |
| 63578 | -112.003 | 0.211 | 4.456 | 0.028 | 3.69 |
| 63579 | -79.718 | 0.150 | 3.323 | 0.021 | 5.60 |
| 63580 | -44.653 | 0.084 | 3.838 | 0.025 | HIGH |
| 63581 | -109.992 | 0.208 | 7.263 | 0.046 | 3.71 |
| 63582 | -80.638 | 0.152 | 2.519 | 0.016 | 5.54 |
| 63583 | -89.000 | 0.168 | 3.570 | 0.023 | 4.91 |
| 63584 | -94.370 | 0.178 | 3.643 | 0.023 | 4.57 |
| 63585 | -85.518 | 0.161 | 2.747 | 0.018 | 5.17 |
| 63586 | -92.073 | 0.174 | 5.724 | 0.037 | 4.66 |
| 63587 | -70.171 | 0.132 | 2.189 | 0.014 | 6.52 |
| 63588 | -82.174 | 0.155 | 2.525 | 0.016 | 5.42 |
| 63589 | -83.869 | 0.158 | 2.629 | 0.017 | 5.29 |
| 63590 | -81.860 | 0.154 | 4.826 | 0.031 | 5.38 |
| 63591 | -68.092 | 0.128 | 2.047 | 0.013 | 6.75 |
| 63592 | -75.617 | 0.143 | 2.150 | 0.014 | 5.98 |
| 63593 | -79.433 | 0.150 | 4.610 | 0.029 | 5.58 |
| 63594 | -68.701 | 0.130 | 3.100 | 0.020 | 6.65 |
| 63595 | -95.591 | 0.180 | 5.420 | 0.035 | 4.46 |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12201 | 30.388 | 0.057 | 0.737 | 0.005 | HIGH |
| 12202 | 71.874 | 0.136 | 0.745 | 0.005 | 6.37 |
| 12204 | 17.557 | 0.033 | 2.708 | 0.017 | HIGH |
| 12205 | 33.513 | 0.063 | 4.210 | 0.027 | HIGH |
| 12206 | -11.890 | 0.022 | 2.346 | 0.015 | HIGH |
| 12207 | -65.290 | 0.123 | 5.652 | 0.036 | 6.93 |
| 12208 | -73.222 | 0.138 | 8.563 | 0.055 | 5.93 |
| 12215 | 13.724 | 0.026 | 2.292 | 0.015 | HIGH |
| 12216 | 23.527 | 0.044 | 1.512 | 0.010 | HIGH |
| 12222 | -81.977 | 0.155 | 6.681 | 0.043 | 5.30 |
| 12223 | -71.088 | 0.134 | 8.322 | 0.053 | 6.14 |
| 12224 | 19.293 | 0.036 | 6.847 | 0.044 | HIGH |
| 12225 | 17.222 | 0.032 | 1.858 | 0.012 | HIGH |
| 12226 | 19.051 | 0.036 | 1.091 | 0.007 | HIGH |
| 12227 | 34.297 | 0.065 | 14.278 | 0.091 | HIGH |
| 12228 | 47.633 | 0.090 | 19.922 | 0.127 | 7.55 |
| 12229 | 4.167 | 0.008 | 27.161 | 0.173 | HIGH |
| 12230 | 44.896 | 0.085 | 5.596 | 0.036 | HIGH |
| 12231 | 3.146 | 0.006 | 9.286 | 0.059 | HIGH |
| 12232 | -100.062 | 0.189 | 3.820 | 0.024 | 4.25 |
| 12233 | -73.914 | 0.139 | 48.400 | 0.309 | 2.74 |
| 12234 | 14.384 | 0.027 | 4.899 | 0.031 | HIGH |
| 12235 | 14.493 | 0.027 | 2.171 | 0.014 | HIGH |
| 12236 | 23.572 | 0.044 | 0.327 | 0.002 | HIGH |
| 12237 | 23.821 | 0.045 | 0.301 | 0.002 | HIGH |
| 12238 | 42.778 | 0.081 | 8.273 | 0.053 | HIGH |
| 12239 | 134.474 | 0.254 | 12.656 | 0.081 | 2.76 |
| 12240 | -0.776 | 0.001 | 59.191 | 0.378 | 4.44 |
| 12241 | -18.197 | 0.034 | 67.327 | 0.430 | 2.61 |
| 12242 | -38.475 | 0.073 | 39.910 | 0.255 | 5.10 |
| 12243 | -69.552 | 0.131 | 2.567 | 0.016 | 6.58 |
| 12244 | -65.761 | 0.124 | 15.038 | 0.096 | 6.11 |
| 12245 | 6.919 | 0.013 | 1.721 | 0.011 | HIGH |
| 12246 | 7.739 | 0.015 | 1.332 | 0.009 | HIGH |
| 12247 | 17.846 | 0.034 | 0.501 | 0.003 | HIGH |
| 12248 | 19.268 | 0.036 | 0.199 | 0.001 | HIGH |
| 12249 | 44.451 | 0.084 | 5.741 | 0.037 | HIGH |
| 12250 | 86.835 | 0.164 | 27.195 | 0.174 | 3.75 |
| 12251 | -23.665 | 0.045 | 278 145 | 1.776 | -0.64 |
| 12252 | -7.508 | 0.014 | 0.704 | 0.004 | HIGH |
| 12253 | -77.426 | 0.146 | 239.851 | 1.532 | -0.56 |
| 12254 | -56.462 | 0.107 | 17.453 | 0.111 | 6.81 |
| 12255 | -57.982 | 0.109 | 11.597 | 0.074 | 7.34 |
| 12256 | -59.553 | 0.112 | 10.698 | 0.068 | 7.23 |
| 12257 | 2.924 | 0.006 | 0.776 | 0.005 | HIGH |

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S.S. 59

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12258 | -0.265 | 0.001 | 0.414 | 0.003 | HIGH |
| 12259 | 8.336 | 0.016 | 0.153 | 0.001 | HIGH |
| 12260 | 4.857 | 0.009 | 0.159 | 0.001 | HIGH |
| 12261 | 19.546 | 0.037 | 3.553 | 0.023 | HIGH |
| 12262 | 32.484 | 0.061 | 9.003 | 0.057 | HIGH |
| 12263 | 111.118 | 0.210 | 20.242 | 0.129 | 3.21 |
| 12264 | -33.758 | 0.064 | 129.274 | 0.826 | 0.28 |
| 12265 | -27.326 | 0.052 | 110.115 | 0.703 | 0.69 |
| 12266 | -35.483 | 0.067 | 37.757 | 0.241 | 5.67 |
| 12267 | -38.563 | 0.073 | 8.659 | 0.055 | HIGH |
| 12268 | -42.605 | 0.080 | 8.236 | 0.053 | HIGH |
| 12269 | -51.700 | 0.098 | 5.223 | 0.033 | 8.99 |
| 12270 | -1.961 | 0.004 | 0.122 | 0.001 | HIGH |
| 12271 | -0.549 | 0.001 | 0.231 | 0.001 | HIGH |
| 12272 | -3.126 | 0.006 | 0.727 | 0.005 | HIGH |
| 12273 | -6.827 | 0.013 | 0.526 | 0.003 | HIGH |
| 12274 | -4.948 | 0.009 | 0.525 | 0.003 | HIGH |
| 12275 | 63.223 | 0.119 | 1.980 | 0.013 | 7.35 |
| 12278 | 1.009 | 0.002 | 0.932 | 0.006 | HIGH |
| 12279 | -9.252 | 0.017 | 0.294 | 0.002 | HIGH |
| 12280 | 0.449 | 0.001 | 0.164 | 0.001 | HIGH |
| 12281 | -14.601 | 0.028 | 0.777 | 0.005 | HIGH |
| 12282 | 7.586 | 0.014 | 2.298 | 0.015 | HIGH |
| 12283 | 41.668 | 0.079 | 10.714 | 0.068 | HIGH |
| 12286 | -19.728 | 0.037 | 0.644 | 0.004 | HIGH |
| 12287 | -18.208 | 0.034 | 0.218 | 0.001 | HIGH |
| 12288 | -17.148 | 0.032 | 0.185 | 0.001 | HIGH |
| 12289 | -21.261 | 0.040 | 0.256 | 0.002 | HIGH |
| 12290 | -30.515 | 0.058 | 2.785 | 0.018 | HIGH |
| 12293 | -18.057 | 0.034 | 0.614 | 0.004 | HIGH |
| 12294 | -26.126 | 0.049 | 0.049 | 0.000 | HIGH |
| 12295 | -2.762 | 0.005 | 0.225 | 0.001 | HIGH |
| 12296 | -71.178 | 0.134 | 2.655 | 0.017 | 6.40 |
| 12297 | -99.651 | 0.188 | 4.411 | 0.028 | 4.26 |
| 12300 | -26.416 | 0.050 | 0.861 | 0.006 | HIGH |
| 12301 | -44.699 | 0.084 | 4.279 | 0.027 | HIGH |
| 12302 | -79.723 | 0.150 | 7.758 | 0.050 | 5.43 |
| 12303 | -103.301 | 0.195 | 11.717 | 0.075 | 3.86 |
| 12304 | -116.177 | 0.219 | 26.945 | 0.172 | 2.77 |
| 12308 | -41.257 | 0.078 | 7.863 | 0.050 | HIGH |
| 12309 | -53.807 | 0.102 | 7.214 | 0.046 | 8.42 |
| 12310 | -104.782 | 0.198 | 34.611 | 0.221 | 2.72 |
| 12311 | -121.558 | 0.229 | 45.130 | 0.288 | 1.92 |
| 12312 | -137.183 | 0.259 | 9.330 | 0.060 | 2.76 |
| 12316 | -26.594 | 0.050 | 16.404 | 0.105 | HIGH |

09.5.5.60

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED. LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12317 | -37.677 | 0.071 | 173.917 | 1.111 | -0.21 |
| 12318 | -79.115 | 0.149 | 82.517 | 0.527 | 1.10 |
| 12319 | -61.484 | 0.116 | 76.101 | 0.486 | 1.51 |
| 12320 | -183.525 | 0.346 | 4.287 | 0.027 | 1.87 |
| 12323 | -14.356 | 0.027 | 138.285 | 0.883 | 0.20 |
| 12324 | -5.607 | 0.011 | 1.015 | 0.006 | HIGH |
| 12325 | -78.752 | 0.149 | 223.144 | 1.425 | -0.50 |
| 12326 | -58.238 | 0.110 | 72.669 | 0.464 | 1.70 |
| 12327 | -34.228 | 0.065 | 1.647 | 0.011 | HIGH |
| 12329 | -27.734 | 0.052 | 101.531 | 0.648 | 0.92 |
| 12330 | -20.515 | 0.039 | 85.807 | 0.548 | 1.58 |
| 12331 | -41.060 | 0.077 | 55.591 | 0.355 | 3.15 |
| 12332 | -10.028 | 0.019 | 24.020 | 0.153 | HIGH |
| 12333 | -48.675 | 0.092 | 25.731 | 0.164 | 6.45 |
| 12334 | -18.676 | 0.035 | 68.513 | 0.438 | 2.70 |
| 12335 | -16.613 | 0.031 | 31.863 | 0.203 | 9.75 |
| 12336 | -14.973 | 0.028 | 17.674 | 0.113 | HIGH |
| 12337 | -19.917 | 0.038 | 8.002 | 0.051 | HIGH |
| 12338 | -11.886 | 0.022 | 24.621 | 0.157 | HIGH |
| 12339 | -8.835 | 0.017 | 13.887 | 0.089 | HIGH |
| 12340 | -8.630 | 0.016 | 9.625 | 0.061 | HIGH |
| 12341 | -10.788 | 0.020 | 5.216 | 0.033 | HIGH |
| 12342 | -4.222 | 0.008 | 5.582 | 0.036 | HIGH |
| 12343 | -9.896 | 0.019 | 3.472 | 0.022 | HIGH |
| 12346 | 14.905 | 0.028 | 4.117 | 0.026 | HIGH |
| 12347 | -4.987 | 0.009 | 5.043 | 0.032 | HIGH |
| 12348 | 27.483 | 0.052 | 19.311 | 0.123 | HIGH |
| 12349 | 21.604 | 0.041 | 10.018 | 0.064 | HIGH |
| 12350 | 20.883 | 0.039 | 6.652 | 0.042 | HIGH |
| 12351 | 27.994 | 0.053 | 6.752 | 0.043 | HIGH |
| 12353 | -191.524 | 0.361 | 6.490 | 0.041 | 1.74 |
| 12354 | -94.574 | 0.178 | 2.303 | 0.015 | 4.58 |
| 12355 | -20.082 | 0.038 | 57.824 | 0.369 | 3.70 |
| 12356 | 11.062 | 0.021 | 41.922 | 0.268 | 7.30 |
| 12357 | 12.783 | 0.024 | 16.547 | 0.106 | HIGH |
| 12358 | 18.111 | 0.034 | 18.132 | 0.116 | HIGH |
| 12361 | -41.459 | 0.078 | 1.998 | 0.013 | HIGH |
| 12362 | 15.205 | 0.029 | 89.270 | 0.570 | 1.48 |
| 12363 | 34.872 | 0.066 | 84.274 | 0.538 | 1.48 |
| 12364 | 14.123 | 0.027 | 53.847 | 0.344 | 4.52 |
| 12365 | 18.357 | 0.035 | 41.730 | 0.266 | 6.49 |
| 12368 | 122.604 | 0.231 | 13.560 | 0.087 | 3.08 |
| 12369 | 36.647 | 0.069 | 54.002 | 0.345 | 3.46 |
| 12370 | 53.594 | 0.101 | 89.443 | 0.571 | 1.10 |
| 12371 | 10.861 | 0.020 | 131.417 | 0.839 | 0.32 |

5.5.61

5.5.62

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12372 | 20.280 | 0.038 | 93.571 | 0.598 | 1.25 |
| 12375 | 202.089 | 0.381 | 10.887 | 0.070 | 1.56 |
| 12376 | 94.792 | 0.179 | 16.666 | 0.106 | 4.03 |
| 12377 | 77.511 | 0.146 | 97.895 | 0.625 | 0.71 |
| 12378 | 4.830 | 0.009 | 0.709 | 0.005 | HIGH |
| 12379 | 26.024 | 0.049 | 105.256 | 0.672 | 0.82 |
| 12383 | 173.196 | 0.327 | 5.299 | 0.034 | 2.04 |
| 12384 | 156.368 | 0.295 | 3.414 | 0.022 | 2.38 |
| 12385 | 135.107 | 0.255 | 10.785 | 0.069 | 2.79 |
| 12386 | 25.759 | 0.049 | 11.714 | 0.075 | HIGH |
| 12387 | 28.766 | 0.054 | 57.591 | 0.368 | 3.39 |
| 12390 | 114.832 | 0.217 | 2.425 | 0.015 | 3.60 |
| 12391 | 97.502 | 0.184 | 0.664 | 0.004 | 4.43 |
| 12392 | 122.215 | 0.231 | 2.479 | 0.016 | 3.32 |
| 12393 | 74.829 | 0.141 | 1.089 | 0.007 | 6.07 |
| 12394 | 61.365 | 0.116 | 4.023 | 0.026 | 7.52 |
| 12396 | 97.412 | 0.184 | 0.568 | 0.004 | 4.44 |
| 12397 | 80.091 | 0.151 | 0.346 | 0.002 | 5.62 |
| 12398 | 80.647 | 0.152 | 0.238 | 0.002 | 5.57 |
| 12399 | 57.696 | 0.109 | 2.185 | 0.014 | 8.14 |
| 12400 | 43.293 | 0.082 | 2.515 | 0.016 | HIGH |
| 12401 | 62.655 | 0.118 | 1.128 | 0.007 | 7.45 |
| 12402 | 55.279 | 0.104 | 1.190 | 0.008 | 8.57 |
| 12403 | 59.121 | 0.112 | 0.360 | 0.002 | 7.96 |
| 12404 | 57.251 | 0.108 | 0.451 | 0.003 | 8.25 |
| 12405 | 19.206 | 0.036 | 2.912 | 0.019 | HIGH |
| 12406 | 43.736 | 0.083 | 4.670 | 0.030 | HIGH |
| 12407 | 41.124 | 0.078 | 1.196 | 0.008 | HIGH |
| 12408 | 40.181 | 0.076 | 0.421 | 0.003 | HIGH |
| 12409 | 43.951 | 0.083 | 0.349 | 0.002 | HIGH |
| 12410 | 30.349 | 0.057 | 5.708 | 0.036 | HIGH |
| 12411 | 28.497 | 0.054 | 0.566 | 0.004 | HIGH |
| 12412 | 22.772 | 0.043 | 0.336 | 0.002 | HIGH |
| 12413 | 23.945 | 0.045 | 1.833 | 0.012 | HIGH |
| 12414 | 25.824 | 0.049 | 0.274 | 0.002 | HIGH |
| 12415 | 17.734 | 0.033 | 0.517 | 0.003 | HIGH |
| 12425 | 38.954 | 0.073 | 3.720 | 0.024 | HIGH |
| 12426 | 73.096 | 0.138 | 1.051 | 0.007 | 6.24 |
| 12427 | 32.904 | 0.062 | 0.444 | 0.003 | HIGH |
| 12443 | 28.033 | 0.053 | 1.335 | 0.009 | HIGH |
| 12444 | 12.207 | 0.023 | 0.335 | 0.002 | HIGH |
| 12445 | 53.640 | 0.101 | 0.767 | 0.005 | 8.87 |
| 12446 | 9.108 | 0.017 | 0.299 | 0.002 | HIGH |
| 12447 | 14.381 | 0.027 | 1.129 | 0.007 | HIGH |
| 12455 | -97.087 | 0.183 | 22.216 | 0.142 | 3.63 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12456 | -86.493 | 0.163 | 34.146 | 0.218 | 3.30 |
| 12463 | 141.767 | 0.267 | 9.288 | 0.059 | 2.64 |
| 12464 | -49.851 | 0.094 | 0.519 | 0.003 | 9.63 |
| 12465 | 68.112 | 0.129 | 2.241 | 0.014 | 6.75 |
| 13301 | 125.774 | 0.237 | 3.360 | 0.021 | 3.19 |
| 13302 | -109.437 | 0.206 | 0 477 | 0.003 | 3.84 |
| 13303 | -152.148 | 0.287 | 0.321 | 0.002 | 2.48 |
| 13304 | 209.452 | 0.395 | 1.493 | 0.010 | 1.53 |
| 13305 | -83.159 | 0.157 | 1.564 | 0.010 | 5.36 |
| 13306 | 119.785 | 0.226 | 1.660 | 0.011 | 3.42 |
| 13307 | -29.269 | 0.055 | 1.921 | 0.012 | HIGH |
| 13308 | 84.469 | 0.159 | 1.752 | 0.011 | 5.26 |
| 13313 | 110.020 | 0.208 | 6.332 | 0.040 | 3.73 |
| 13314 | 156.244 | 0.295 | 1.102 | 0.007 | 2.39 |
| 13319 | -38.936 | 0.073 | 1.236 | 0.008 | HIGH |
| 13320 | -20.864 | 0.039 | 0.752 | 0.005 | HIGH |
| 13321 | 134.766 | 0.254 | 7.077 | 0.045 | 2.87 |
| 13322 | 153.180 | 0.289 | 2.353 | 0.015 | 2.45 |
| 13323 | 122.912 | 0.232 | 1.153 | 0.007 | 3.31 |
| 13324 | 96.387 | 0.182 | 0.939 | 0.006 | 4.49 |
| 13325 | 54.071 | 0.102 | 1.517 | 0.010 | 8.77 |
| 13326 | -14.780 | 0.028 | 2.053 | 0.013 | HIGH |
| 13327 | -49.355 | 0.093 | 0.874 | 0.006 | 9.73 |
| 13328 | -58.413 | 0.110 | 0.985 | 0.006 | 8.06 |
| 13329 | -45.452 | 0.086 | 0.747 | 0.005 | HIGH |
| 13330 | -29.146 | 0.055 | 2.050 | 0.013 | HIGH |
| 13331 | 108.918 | 0.206 | 5.558 | 0.035 | 3.80 |
| 13332 | 100.585 | 0.190 | 3.356 | 0.021 | 4.24 |
| 13333 | 100.820 | 0.190 | 0.993 | 0.006 | 4.25 |
| 13334 | 72.727 | 0.137 | 0.976 | 0.006 | 6.28 |
| 13335 | 48.051 | 0.091 | 0.746 | 0.005 | HIGH |
| 13336 | 10.652 | 0.020 | 1.198 | 0.008 | HIGH |
| 13337 | -27.015 | 0.051 | 0.701 | 0.004 | HIGH |
| 13338 | -42.223 | 0.080 | 1.026 | 0.007 | HIGH |
| 13339 | -43.162 | 0.081 | 1.005 | 0.006 | HIGH |
| 13340 | -22.873 | 0.043 | 0.614 | 0.004 | HIGH |
| 13341 | -19.387 | 0.037 | 1.872 | 0.012 | HIGH |
| 13342 | 75.346 | 0.142 | 2.790 | 0.018 | 5.99 |
| 13343 | 62.926 | 0.119 | 3.208 | 0.020 | 7.34 |
| 13344 | 71.368 | 0.135 | 1.032 | 0.007 | 6.42 |
| 13345 | 61.843 | 0.117 | 0.720 | 0.005 | 7.56 |
| 13346 | 41.428 | 0.078 | 0.684 | 0.004 | HIGH |
| 13347 | 18.392 | 0.035 | 0.514 | 0.003 | HIGH |
| 13348 | -6.270 | 0.012 | 0.524 | 0.003 | HIGH |
| 13349 | -29.135 | 0.055 | 0.701 | 0.004 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13350 | -32.979 | 0.062 | 0.740 | 0.005 | HIGH |
| 13351 | -26.978 | 0.051 | 0.737 | 0.005 | HIGH |
| 13352 | -10.302 | 0.019 | 0.872 | 0.006 | HIGH |
| 13353 | -15.553 | 0.029 | 1.686 | 0.011 | HIGH |
| 13354 | 24.302 | 0.046 | 1.824 | 0.012 | HIGH |
| 13355 | 30.290 | 0.057 | 2.430 | 0.016 | HIGH |
| 13356 | 45.147 | 0.085 | 1.094 | 0.007 | HIGH |
| 13357 | 46.408 | 0.088 | 0.430 | 0.003 | HIGH |
| 13358 | 36.858 | 0.070 | 0.413 | 0.003 | HIGH |
| 13359 | 21.170 | 0.040 | 0.300 | 0.002 | HIGH |
| 13360 | 4.334 | 0.008 | 0.054 | 0.000 | HIGH |
| 13361 | -10.673 | 0.020 | 0.377 | 0.002 | HIGH |
| 13362 | -22.065 | 0.042 | 0.631 | 0.004 | HIGH |
| 13363 | -22.925 | 0.043 | 0.638 | 0.004 | HIGH |
| 13364 | -17.022 | 0.032 | 0.465 | 0.003 | HIGH |
| 13365 | -8.014 | 0.015 | 0.927 | 0.006 | HIGH |
| 13366 | -21.532 | 0.041 | 0.893 | 0.006 | HIGH |
| 13367 | -27.067 | 0.051 | 8.873 | 0.057 | HIGH |
| 13368 | 5.050 | 0.010 | 2.634 | 0.017 | HIGH |
| 13369 | 23.047 | 0.043 | 0.346 | 0.002 | HIGH |
| 13370 | 30.780 | 0.058 | 0.198 | 0.001 | HIGH |
| 13371 | 28.942 | 0.055 | 0.197 | 0.001 | HIGH |
| 13372 | 21.378 | 0.040 | 0.190 | 0.001 | HIGH |
| 13373 | 11.281 | 0.021 | 0.043 | 0.000 | HIGH |
| 13374 | 0.605 | 0.001 | 0.144 | 0.001 | HIGH |
| 13375 | -5.267 | 0.010 | 0.396 | 0.003 | HIGH |
| 13376 | -13.214 | 0.025 | 0.439 | 0.003 | HIGH |
| 13377 | -12.120 | 0.023 | 0.443 | 0.003 | HIGH |
| 13378 | -9.983 | 0.019 | 0.209 | 0.001 | HIGH |
| 13379 | -13.151 | 0.025 | 0.527 | 0.003 | HIGH |
| 13380 | -32.489 | 0.061 | 6.896 | 0.044 | HIGH |
| 13382 | -15.863 | 0.030 | 5.318 | 0.034 | HIGH |
| 13383 | 2.620 | 0.005 | 1.390 | 0.009 | HIGH |
| 13384 | 15.923 | 0.030 | 0.168 | 0.001 | HIGH |
| 13385 | 18.309 | 0.035 | 0.092 | 0.001 | HIGH |
| 13386 | 16.643 | 0.031 | 0.020 | 0.000 | HIGH |
| 13387 | 13.771 | 0.026 | 0.070 | 0.000 | HIGH |
| 13388 | 10.501 | 0.020 | 0.114 | 0.001 | HIGH |
| 13389 | 6.291 | 0.012 | 0.159 | 0.001 | HIGH |
| 13390 | 2.730 | 0.005 | 0.279 | 0.002 | HIGH |
| 13391 | 2.320 | 0.004 | 0.260 | 0.002 | HIGH |
| 13392 | 5.149 | 0.010 | 0.157 | 0.001 | HIGH |
| 13393 | 9.379 | 0.018 | 0.660 | 0.004 | HIGH |
| 13394 | 14.143 | 0.027 | 1.395 | 0.009 | HIGH |
| 13397 | 194.967 | 0.368 | 12.477 | 0.080 | 1.63 |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13398 | 133.458 | 0.252 | 2.098 | 0.013 | 2.96 |
| 13399 | 95.596 | 0.180 | 0.363 | 0.002 | 4.54 |
| 13400 | 73.336 | 0.138 | 1.036 | 0.007 | 6.22 |
| 13401 | 45.849 | 0.087 | 1.422 | 0.009 | HIGH |
| 13402 | -6.525 | 0.012 | 0.881 | 0.006 | HIGH |
| 13403 | -120.835 | 0.228 | 3.781 | 0.024 | 3.36 |
| 13406 | 151.421 | 0.286 | 4.670 | 0.030 | 2.47 |
| 13407 | 150.218 | 0.283 | 1.659 | 0.011 | 2.52 |
| 13408 | 132.510 | 0.250 | 0.336 | 0.002 | 3.00 |
| 13409 | 117.919 | 0.222 | 0.911 | 0.006 | 3.49 |
| 13410 | 109.706 | 0.207 | 0.917 | 0.006 | 3.83 |
| 13411 | 109.654 | 0.207 | 0.875 | 0.006 | 3.83 |
| 13412 | 117.951 | 0.223 | 2.405 | 0.015 | 3.48 |
| 13413 | 6.536 | 0.012 | 5.170 | 0.033 | HIGH |
| 13415 | 148.639 | 0.280 | 0.887 | 0.006 | 2.56 |
| 13416 | 153.459 | 0.290 | 0.460 | 0.003 | 2.45 |
| 13417 | 145.974 | 0.275 | 0.510 | 0.003 | 2.63 |
| 13418 | 144.928 | 0.273 | 0.523 | 0.003 | 2.66 |
| 13419 | 154.617 | 0.292 | 0.530 | 0.003 | 2.43 |
| 13420 | 182.770 | 0.345 | 0.490 | 0.003 | 1.90 |
| 13421 | 187.427 | 0.354 | 0.654 | 0.004 | 1.83 |
| 13424 | 142.204 | 0.268 | 0.612 | 0.004 | 2.73 |
| 13425 | 158.074 | 0.298 | 0.227 | 0.001 | 2.35 |
| 13426 | 160.121 | 0.302 | 0.219 | 0.001 | 2.31 |
| 13427 | 169.841 | 0.320 | 0.104 | 0.001 | 2.12 |
| 13428 | 190.380 | 0.359 | 0.196 | 0.001 | 1.78 |
| 13429 | 215.120 | 0.406 | 0.548 | 0.004 | 1.46 |
| 13430 | 243.734 | 0.460 | 2.842 | 0.018 | 1.17 |
| 13432 | 143.781 | 0.271 | 0.062 | 0.000 | 2.69 |
| 13433 | 163.779 | 0.309 | 0.146 | 0.001 | 2.24 |
| 13434 | 171.539 | 0.324 | 0.384 | 0.002 | 2.09 |
| 13435 | 187.354 | 0.353 | 0.489 | 0.003 | 1.83 |
| 13436 | 210.512 | 0.397 | 0.568 | 0.004 | 1.52 |
| 13437 | 247.946 | 0.468 | 4.029 | 0.026 | 1.13 |
| 13438 | 266.234 | 0.502 | 2.213 | 0.014 | 0.99 |
| 13440 | 144.890 | 0.273 | 0.350 | 0.002 | 2.66 |
| 13441 | 165.620 | 0.312 | 0.511 | 0.003 | 2.20 |
| 13442 | 175.913 | 0.332 | 0.661 | 0.004 | 2.01 |
| 13443 | 192.883 | 0.364 | 0.687 | 0.004 | 1.75 |
| 13444 | 217.651 | 0.411 | 0.936 | 0.006 | 1.43 |
| 13445 | 255.377 | 0.482 | 1.424 | 0.009 | 1.07 |
| 13446 | 275.604 | 0.520 | 2.485 | 0.016 | 0.92 |
| 13450 | 140.910 | 0.266 | 0.480 | 0.003 | 2.76 |
| 13451 | 160.746 | 0.303 | 0.753 | 0.005 | 2.30 |
| 13452 | 171.606 | 0.324 | 0.742 | 0.005 | 2.09 |

5.5.65

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13453 | 186.774 | 0.352 | 0.597 | 0.004 | 1.84 |
| 13454 | 206.984 | 0.391 | 0.722 | 0.005 | 1.56 |
| 13455 | 222.330 | 0.419 | 0.719 | 0.005 | 1.38 |
| 13456 | 220.848 | 0.417 | 0.602 | 0.004 | 1.40 |
| 13457 | 127.287 | 0.240 | 4.657 | 0.030 | 3.13 |
| 13459 | 131.643 | 0.248 | 0.705 | 0.004 | 3.02 |
| 13460 | 150.299 | 0.284 | 0.900 | 0.006 | 2.52 |
| 13461 | 158.847 | 0.300 | 0.888 | 0.006 | 2.34 |
| 13462 | 170.812 | 0.322 | 0.482 | 0.003 | 2.10 |
| 13463 | 177.331 | 0.335 | 0.347 | 0.002 | 1.99 |
| 13464 | 178.482 | 0.337 | 0.325 | 0.002 | 1.97 |
| 13465 | 160.667 | 0.303 | 1.203 | 0.008 | 2.30 |
| 13467 | 121.105 | 0.228 | 1.148 | 0.007 | 3.37 |
| 13468 | 136.777 | 0.258 | 1.059 | 0.007 | 2.87 |
| 13469 | 142.364 | 0.269 | 0.994 | 0.006 | 2.72 |
| 13470 | 143.455 | 0.271 | 0.527 | 0.003 | 2.69 |
| 13471 | 137.711 | 0.260 | 0.444 | 0.003 | 2.85 |
| 13472 | 117.736 | 0.222 | 0.949 | 0.006 | 3.50 |
| 13473 | 90.340 | 0.170 | 1.183 | 0.008 | 4.86 |
| 13474 | 110.024 | 0.208 | 1.451 | 0.009 | 3.81 |
| 13475 | 120.920 | 0.228 | 1.395 | 0.009 | 3.38 |
| 13476 | 120.075 | 0.227 | 1.073 | 0.007 | 3.41 |
| 13477 | 114.438 | 0.216 | 0.466 | 0.003 | 3.63 |
| 13478 | 98.073 | 0.185 | 1.033 | 0.007 | 4.40 |
| 13479 | 83.391 | 0.157 | 2.626 | 0.017 | 5.32 |
| 13480 | 94.111 | 0.178 | 1.993 | 0.013 | 4.62 |
| 13481 | 100.394 | 0.189 | 1.626 | 0.010 | 4.27 |
| 13482 | 98.513 | 0.186 | 1.019 | 0.007 | 4.38 |
| 13483 | 89.790 | 0.169 | 0.944 | 0.006 | 4.90 |
| 13484 | 83.910 | 0.158 | 2.997 | 0.019 | 5.28 |
| 13485 | 74.995 | 0.142 | 2.215 | 0.014 | 6.04 |
| 13486 | 78.871 | 0.149 | 1.594 | 0.010 | 5.71 |
| 13487 | 82.273 | 0.155 | 0.970 | 0.006 | 5.44 |
| 13488 | 83.904 | 0.158 | 2.579 | 0.016 | 5.29 |
| 13489 | 57.340 | 0.108 | 2.241 | 0.014 | 8.19 |
| 13490 | 60.077 | 0.113 | 1.759 | 0.011 | 7.79 |
| 13491 | 68.327 | 0.129 | 2.720 | 0.017 | 6.71 |
| 13492 | 77.361 | 0.146 | 3.004 | 0.019 | 5.80 |
| 13499 | 92.996 | 0.175 | 2.263 | 0.014 | 4.68 |
| 13500 | 19.706 | 0.037 | 0.610 | 0.004 | HIGH |
| 13501 | -22.000 | 0.042 | 0.358 | 0.002 | HIGH |
| 13502 | -50.421 | 0.095 | 0.118 | 0.001 | 9.51 |
| 13503 | -70.853 | 0.134 | 0.252 | 0.002 | 6.48 |
| 13504 | -83.397 | 0.157 | 0.589 | 0.004 | 5.35 |
| 13505 | -84.142 | 0.159 | 2.474 | 0.016 | 5.27 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13509 | 8.251 | 0.016 | 2.095 | 0.013 | HIGH |
| 13510 | -16.667 | 0.031 | 0.510 | 0.003 | HIGH |
| 13511 | -36.753 | 0.069 | 0.270 | 0.002 | HIGH |
| 13512 | -53.235 | 0.100 | 0.345 | 0.002 | 8.95 |
| 13513 | -62.078 | 0.117 | 0.415 | 0.003 | 7.54 |
| 13514 | -58.798 | 0.111 | 0.840 | 0.005 | 8.01 |
| 13515 | -56.114 | 0.106 | 1.591 | 0.010 | 8.42 |
| 13518 | -37.931 | 0.072 | 0.782 | 0.005 | HIGH |
| 13519 | -47.121 | 0.089 | 0.577 | 0.004 | HIGH |
| 13520 | -46.071 | 0.087 | 0.554 | 0.004 | HIGH |
| 13521 | -51.918 | 0.098 | 0.627 | 0.004 | 9.20 |
| 13522 | -57.663 | 0.109 | 0.739 | 0.005 | 8.18 |
| 13523 | -59.655 | 0.113 | 0.949 | 0.006 | 7.87 |
| 13524 | -54.947 | 0.104 | 1.727 | 0.011 | 8.61 |
| 13526 | -117.290 | 0.221 | 3.631 | 0.023 | 3.49 |
| 13527 | -89.934 | 0.170 | 0.557 | 0.004 | 4.89 |
| 13528 | -74.717 | 0.141 | 0.883 | 0.006 | 6.09 |
| 13529 | -65.651 | 0.124 | 0.950 | 0.006 | 7.06 |
| 13530 | -64.658 | 0.122 | 1.060 | 0.007 | 7.19 |
| 13531 | -65.605 | 0.124 | 1.262 | 0.008 | 7.06 |
| 13532 | -57.716 | 0.109 | 1.433 | 0.009 | 8.16 |
| 13534 | -162.361 | 0.306 | 1.185 | 0.008 | 2.26 |
| 13535 | -149.200 | 0.282 | 4.324 | 0.028 | 2.53 |
| 13536 | -111.607 | 0.211 | 1.020 | 0.007 | 3.75 |
| 13537 | -90.078 | 0.170 | 1.214 | 0.008 | 4.88 |
| 13538 | -85.965 | 0.162 | 1.287 | 0.008 | 5.16 |
| 13539 | -79.135 | 0.149 | 1.524 | 0.010 | 5.68 |
| 13540 | -66.278 | 0.125 | 1.933 | 0.012 | 6.97 |
| 13544 | -198.392 | 0.374 | 2.068 | 0.013 | 1.67 |
| 13545 | -185.416 | 0.350 | 1.400 | 0.009 | 1.86 |
| 13546 | -148.001 | 0.279 | 0.928 | 0.006 | 2.58 |
| 13547 | -123.310 | 0.233 | 1.198 | 0.008 | 3.29 |
| 13548 | -108.255 | 0.204 | 1.377 | 0.009 | 3.89 |
| 13549 | -97.352 | 0.184 | 1.570 | 0.010 | 4.43 |
| 13550 | -79.857 | 0.151 | 2.289 | 0.015 | 5.61 |
| 13553 | -202.860 | 0.383 | 1.222 | 0.008 | 1.61 |
| 13554 | -197.148 | 0.372 | 0.699 | 0.004 | 1.69 |
| 13555 | -172.422 | 0.325 | 0.696 | 0.004 | 2.07 |
| 13556 | -149.376 | 0.282 | 0.913 | 0.006 | 2.55 |
| 13557 | -132.438 | 0.250 | 1.333 | 0.009 | 3.00 |
| 13558 | -121.654 | 0.230 | 1.469 | 0.009 | 3.35 |
| 13559 | -101.700 | 0.192 | 1.873 | 0.012 | 4.20 |
| 13561 | -230.149 | 0.434 | 0.432 | 0.003 | 1.30 |
| 13562 | -217.237 | 0.410 | 0.503 | 0.003 | 1.44 |
| 13563 | -189.132 | 0.357 | 0.491 | 0.003 | 1.80 |

5.5.67

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13564 | -168.670 | 0.318 | 0.735 | 0.005 | 2.14 |
| 13565 | -152.874 | 0.288 | 1.240 | 0.008 | 2.46 |
| 13566 | -142.686 | 0.269 | 1.323 | 0.008 | 2.71 |
| 13567 | -121.990 | 0.230 | 1.374 | 0.009 | 3.34 |
| 13568 | -138.410 | 0.261 | 3.211 | 0.021 | 2.81 |
| 13569 | -183.074 | 0.345 | 1.625 | 0.010 | 1.89 |
| 13570 | -183.163 | 0.346 | 0.926 | 0.006 | 1.89 |
| 13571 | -173.522 | 0.327 | 0.667 | 0.004 | 2.05 |
| 13572 | -163.853 | 0.309 | 1.244 | 0.008 | 2.23 |
| 13573 | -156.169 | 0.295 | 1.301 | 0.008 | 2.39 |
| 13574 | -134.990 | 0.255 | 1.351 | 0.009 | 2.92 |
| 13575 | -136.753 | 0.258 | 7.127 | 0.046 | 2.81 |
| 13576 | -153.467 | 0.290 | 2.552 | 0.016 | 2.44 |
| 13577 | -161.705 | 0.305 | 0.869 | 0.006 | 2.28 |
| 13578 | -162.792 | 0.307 | 1.220 | 0.008 | 2.25 |
| 13579 | -160.792 | 0.303 | 1.477 | 0.009 | 2.29 |
| 13580 | -140.697 | 0.265 | 1.526 | 0.010 | 2.76 |
| 13581 | -125.195 | 0.236 | 8.369 | 0.053 | 3.13 |
| 13582 | -134.193 | 0.253 | 2.557 | 0.016 | 2.94 |
| 13583 | -148.808 | 0.281 | 0.803 | 0.005 | 2.56 |
| 13584 | -156.328 | 0.295 | 1.757 | 0.011 | 2.39 |
| 13585 | -140.411 | 0.265 | 1.817 | 0.012 | 2.77 |
| 13586 | -102.689 | 0.194 | 6.790 | 0.043 | 4.05 |
| 13587 | -123.071 | 0.232 | 1.870 | 0.012 | 3.30 |
| 13588 | -140.806 | 0.266 | 1.976 | 0.013 | 2.76 |
| 13589 | -135.391 | 0.255 | 2.151 | 0.014 | 2.91 |
| 13590 | -84.604 | 0.160 | 2.888 | 0.018 | 5.23 |
| 13591 | -124.117 | 0.234 | 6.115 | 0.039 | 3.21 |
| 13592 | -124.066 | 0.234 | 4.605 | 0.029 | 3.23 |
| 13594 | -189.227 | 0.357 | 15.400 | 0.098 | 1.67 |
| 22201 | -119.850 | 0.226 | 6.169 | 0.039 | 3.36 |
| 22202 | 9.817 | 0.019 | 4.027 | 0.026 | HIGH |
| 22203 | -18.487 | 0.035 | 2.179 | 0.014 | HIGH |
| 22204 | -104.140 | 0.196 | 3.494 | 0.022 | 4.06 |
| 22205 | -86.978 | 0.164 | 12.782 | 0.082 | 4.66 |
| 22206 | 0.994 | 0.002 | 12.393 | 0.079 | HIGH |
| 22207 | -51.329 | 0.097 | 15.154 | 0.097 | 7.80 |
| 22208 | 8.251 | 0.016 | 24.200 | 0.155 | HIGH |
| 22215 | -111.221 | 0.210 | 11.574 | 0.074 | 3.54 |
| 22216 | -114.584 | 0.216 | 4.216 | 0.027 | 3.59 |
| 22222 | -53.742 | 0.101 | 30.940 | 0.198 | 5.25 |
| 22223 | -17.623 | 0.033 | 47.830 | 0.305 | 5.30 |
| 22224 | -112.701 | 0.213 | 12.880 | 0.082 | 3.44 |
| 22225 | -96.862 | 0.183 | 4.710 | 0.030 | 4.41 |
| 22226 | -72.469 | 0.137 | 1.842 | 0.012 | 6.29 |

89.5.5

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22227 | -67.073 | 0.127 | 3.310 | 0.021 | 6.83 |
| 22228 | -59.448 | 0.112 | 5.325 | 0.034 | 7.71 |
| 22229 | -57.333 | 0.108 | 9.791 | 0.063 | 7.62 |
| 22230 | -57.029 | 0.108 | 11.700 | 0.075 | 7.45 |
| 22231 | -47.953 | 0.090 | 45.478 | 0.290 | 3.87 |
| 22232 | -25.355 | 0.048 | 63.603 | 0.406 | 2.93 |
| 22233 | -13.898 | 0.026 | 102.225 | 0.653 | 1.00 |
| 22234 | -99.683 | 0.188 | 5.157 | 0.033 | 4.25 |
| 22235 | -71.712 | 0.135 | 4.467 | 0.029 | 6.28 |
| 22236 | -61.388 | 0.116 | 2.465 | 0.016 | 7.58 |
| 22237 | -49.379 | 0.093 | 2.874 | 0.018 | 9.63 |
| 22238 | -44.901 | 0.085 | 6.454 | 0.041 | HIGH |
| 22239 | -41.582 | 0.078 | 11.397 | 0.073 | HIGH |
| 22240 | -39.600 | 0.075 | 12.503 | 0.080 | HIGH |
| 22241 | -40.996 | 0.077 | 17.588 | 0.112 | 9.09 |
| 22242 | -52.325 | 0.099 | 176.701 | 1.128 | -0.25 |
| 22243 | -7.901 | 0.015 | 1.514 | 0.010 | HIGH |
| 22244 | -26.631 | 0.050 | 281.486 | 1.797 | -0.65 |
| 22245 | -87.041 | 0.164 | 3.432 | 0.022 | 5.04 |
| 22246 | -49.765 | 0.094 | 2.072 | 0.013 | 9.59 |
| 22247 | -50.718 | 0.096 | 2.693 | 0.017 | 9.36 |
| 22248 | -39.409 | 0.074 | 1.248 | 0.008 | HIGH |
| 22249 | -33.436 | 0.063 | 3.663 | 0.023 | HIGH |
| 22250 | -30.914 | 0.058 | 8.374 | 0.053 | HIGH |
| 22251 | -24.761 | 0.047 | 10.715 | 0.068 | HIGH |
| 22252 | -20.128 | 0.038 | 12.184 | 0.078 | HIGH |
| 22253 | -13.535 | 0.026 | 40.129 | 0.256 | 7.49 |
| 22254 | -5.278 | 0.010 | 108.881 | 0.695 | 0.85 |
| 22255 | -78.037 | 0.147 | 167.883 | 1.072 | -0.22 |
| 22256 | -57.532 | 0.109 | 30.822 | 0.197 | 5.00 |
| 22257 | -66.253 | 0.125 | 4.005 | 0.026 | 6.90 |
| 22258 | -36.880 | 0.070 | 0.899 | 0.006 | HIGH |
| 22259 | -68.084 | 0.128 | 1.661 | 0.011 | 6.76 |
| 22260 | -19.003 | 0.036 | 1.624 | 0.010 | HIGH |
| 22261 | -23.359 | 0.044 | 1.411 | 0.009 | HIGH |
| 22262 | -21.453 | 0.040 | 1.605 | 0.010 | HIGH |
| 22263 | -16.201 | 0.031 | 4.941 | 0.032 | HIGH |
| 22264 | -13.479 | 0.025 | 4.952 | 0.032 | HIGH |
| 22265 | -12.052 | 0.023 | 5.058 | 0.032 | HIGH |
| 22266 | -17.649 | 0.033 | 33.106 | 0.211 | 9.08 |
| 22267 | -37.158 | 0.070 | 54.789 | 0.350 | 3.36 |
| 22268 | -31.500 | 0.059 | 42.121 | 0.269 | 5.25 |
| 22269 | -37.995 | 0.072 | 9.882 | 0.063 | HIGH |
| 22270 | 27.623 | 0.052 | 2.562 | 0.016 | HIGH |
| 22271 | -1.328 | 0.003 | 1.919 | 0.012 | HIGH |

5.5.69

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22272 | 20.803 | 0.039 | 2.485 | 0.016 | HIGH |
| 22273 | -5.314 | 0.010 | 3.629 | 0.023 | HIGH |
| 22274 | -26.062 | 0.049 | 3.057 | 0.020 | HIGH |
| 22275 | 23.271 | 0.044 | 1.226 | 0.008 | HIGH |
| 22278 | 26.603 | 0.050 | 6.541 | 0.042 | HIGH |
| 22279 | 13.945 | 0.026 | 2.094 | 0.013 | HIGH |
| 22280 | -35.286 | 0.067 | 3.547 | 0.023 | HIGH |
| 22281 | -45.744 | 0.086 | 3.522 | 0.022 | HIGH |
| 22282 | -73.421 | 0.139 | 2.901 | 0.019 | 6.17 |
| 22283 | -46.160 | 0.087 | 4.701 | 0.030 | HIGH |
| 22286 | 5.532 | 0.010 | 2.036 | 0.013 | HIGH |
| 22287 | -28.603 | 0.054 | 2.763 | 0.018 | HIGH |
| 22288 | -39.878 | 0.075 | 3.177 | 0.020 | HIGH |
| 22289 | -51.835 | 0.098 | 3.208 | 0.020 | 9.11 |
| 22290 | -60.116 | 0.113 | 3.037 | 0.019 | 7.74 |
| 22293 | -29.274 | 0.055 | 4.774 | 0.030 | HIGH |
| 22294 | -25.362 | 0.048 | 2.321 | 0.015 | HIGH |
| 22295 | -31.203 | 0.059 | 3.065 | 0.020 | HIGH |
| 22296 | -35.567 | 0.067 | 3.152 | 0.020 | HIGH |
| 22297 | -40.721 | 0.077 | 2.192 | 0.014 | HIGH |
| 22300 | -2.808 | 0.005 | 1.177 | 0.008 | HIGH |
| 22301 | -5.464 | 0.010 | 1.141 | 0.007 | HIGH |
| 22302 | -7.802 | 0.015 | 4.592 | 0.029 | HIGH |
| 22303 | -10.958 | 0.021 | 6.052 | 0.039 | HIGH |
| 22304 | -13.529 | 0.026 | 6.468 | 0.041 | HIGH |
| 22308 | 17.506 | 0.033 | 1.646 | 0.011 | HIGH |
| 22309 | 23.027 | 0.043 | 4.897 | 0.031 | HIGH |
| 22310 | 17.053 | 0.032 | 10.508 | 0.067 | HIGH |
| 22311 | 15.213 | 0.029 | 13.515 | 0.086 | HIGH |
| 22312 | 12.631 | 0.024 | 15.748 | 0.101 | HIGH |
| 22316 | 44.365 | 0.084 | 11.441 | 0.073 | 9.64 |
| 22317 | 41.339 | 0.078 | 11.177 | 0.071 | HIGH |
| 22318 | 36.880 | 0.070 | 22.928 | 0.146 | 8.59 |
| 22319 | 38.373 | 0.072 | 25.123 | 0.160 | 7.84 |
| 22320 | 28.937 | 0.055 | 23.356 | 0.149 | HIGH |
| 22323 | 61.846 | 0.117 | 21.305 | 0.136 | 5.79 |
| 22324 | 60.374 | 0.114 | 19.156 | 0.122 | 6.18 |
| 22325 | 53.987 | 0.102 | 49.374 | 0.315 | 3.26 |
| 22326 | 65.354 | 0.123 | 63.988 | 0.409 | 2.01 |
| 22327 | 41.961 | 0.079 | 22.214 | 0.142 | 7.93 |
| 22329 | 76.934 | 0.145 | 49.764 | 0.318 | 2.58 |
| 22330 | 82.909 | 0.156 | 49.441 | 0.316 | 2.46 |
| 22331 | 74.941 | 0.141 | 103.744 | 0.662 | 0.59 |
| 22332 | 69.183 | 0.131 | 113.017 | 0.722 | 0.44 |
| 22333 | 46.500 | 0.088 | 25.373 | 0.162 | 6.75 |

S.S.70

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22334 | 87.292 | 0.165 | 75.519 | 0.482 | 1.25 |
| 22335 | 107.980 | 0.204 | 191.194 | 1.221 | -0.38 |
| 22336 | 16.148 | 0.030 | 0.160 | 0.001 | HIGH |
| 22337 | 114.510 | 0.216 | 223.498 | 1.427 | -0.52 |
| 22338 | 62.282 | 0.118 | 56.911 | 0.363 | 2.48 |
| 22339 | 56.039 | 0.106 | 115.717 | 0.739 | 0.44 |
| 22340 | 104.545 | 0.197 | 9.588 | 0.061 | 3.88 |
| 22341 | 40.176 | 0.076 | 18.853 | 0.120 | 8.96 |
| 22342 | 49.543 | 0.093 | 22.930 | 0.146 | 6.80 |
| 22343 | 20.913 | 0.039 | 13.470 | 0.086 | HIGH |
| 22346 | 5.513 | 0.010 | 32.783 | 0.209 | HIGH |
| 22347 | -47.396 | 0.089 | 109.308 | 0.698 | 0.61 |
| 22348 | -7.351 | 0.014 | 37.219 | 0.238 | 9.55 |
| 22349 | -20.164 | 0.038 | 80.020 | 0.511 | 1.88 |
| 22350 | -31.810 | 0.060 | 40.899 | 0.261 | 5.43 |
| 22351 | -22.899 | 0.043 | 11.105 | 0.071 | HIGH |
| 22353 | -21.446 | 0.040 | 64.388 | 0.411 | 2.97 |
| 22354 | -75.415 | 0.142 | 20.197 | 0.129 | 4.88 |
| 22355 | -94.373 | 0.178 | 93.707 | 0.598 | 0.71 |
| 22356 | -10.194 | 0.019 | 0.167 | 0.001 | HIGH |
| 22357 | -36.622 | 0.069 | 94.895 | 0.606 | 1.06 |
| 22358 | -41.557 | 0.078 | 43.990 | 0.281 | 4.35 |
| 22361 | -69.263 | 0.131 | 40.717 | 0.260 | 3.44 |
| 22362 | -76.099 | 0.144 | 34.153 | 0.218 | 3.69 |
| 22363 | -64.648 | 0.122 | 48.600 | 0.310 | 2.98 |
| 22364 | -72.355 | 0.137 | 40.112 | 0.256 | 3.37 |
| 22365 | -51.241 | 0.097 | 68.039 | 0.434 | 2.04 |
| 22368 | -75.226 | 0.142 | 20.814 | 0.133 | 4.84 |
| 22369 | -74.300 | 0.140 | 14.706 | 0.094 | 5.41 |
| 22370 | -72.675 | 0.137 | 34.773 | 0.222 | 3.79 |
| 22371 | -78.968 | 0.149 | 35.734 | 0.228 | 3.46 |
| 22372 | -71.866 | 0.136 | 66.250 | 0.423 | 1.80 |
| 22375 | -65.444 | 0.123 | 7.774 | 0.050 | 6.77 |
| 22376 | -66.529 | 0.126 | 7.375 | 0.047 | 6.68 |
| 22377 | -68.315 | 0.129 | 18.126 | 0.116 | 5.58 |
| 22378 | -72.739 | 0.137 | 19.538 | 0.125 | 5.12 |
| 22379 | -72.913 | 0.138 | 36.188 | 0.231 | 3.66 |
| 22383 | -43.829 | 0.083 | 1.682 | 0.011 | HIGH |
| 22384 | -50.105 | 0.095 | 2.109 | 0.013 | 9.52 |
| 22385 | -53.271 | 0.101 | 8.111 | 0.052 | 8.42 |
| 22386 | -59.270 | 0.112 | 8.590 | 0.055 | 7.47 |
| 22387 | -60.826 | 0.115 | 14.011 | 0.089 | 6.73 |
| 22390 | -24.562 | 0.046 | 2.186 | 0.014 | HIGH |
| 22391 | -28.832 | 0.054 | 1.036 | 0.007 | HIGH |
| 22392 | -33.154 | 0.063 | 3.492 | 0.022 | HIGH |

17.5.5.71

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22393 | -35.543 | 0.067 | 4.283 | 0.027 | HIGH |
| 22394 | -44.633 | 0.084 | 4.904 | 0.031 | HIGH |
| 22396 | 17.095 | 0.032 | 2.211 | 0.014 | HIGH |
| 22397 | -0.864 | 0.002 | 1.934 | 0.012 | HIGH |
| 22398 | -12.689 | 0.024 | 1.955 | 0.012 | HIGH |
| 22399 | -18.482 | 0.035 | 2.118 | 0.014 | HIGH |
| 22400 | -19.368 | 0.037 | 2.349 | 0.015 | HIGH |
| 22401 | 26.213 | 0.049 | 4.720 | 0.030 | HIGH |
| 22402 | 11.661 | 0.022 | 4.325 | 0.028 | HIGH |
| 22403 | 1.640 | 0.003 | 2.263 | 0.014 | HIGH |
| 22404 | -9.346 | 0.018 | 2.036 | 0.013 | HIGH |
| 22405 | -4.098 | 0.008 | 2.518 | 0.016 | HIGH |
| 22406 | 21.526 | 0.041 | 12.497 | 0.080 | HIGH |
| 22407 | -6.968 | 0.013 | 4.619 | 0.029 | HIGH |
| 22408 | -12.737 | 0.024 | 2.090 | 0.013 | HIGH |
| 22409 | -6.484 | 0.012 | 4.345 | 0.028 | HIGH |
| 22410 | 30.191 | 0.057 | 9.509 | 0.061 | HIGH |
| 22411 | 5.038 | 0.010 | 3.513 | 0.022 | HIGH |
| 22412 | -25.647 | 0.048 | 4.421 | 0.028 | HIGH |
| 22413 | 26.748 | 0.050 | 3.949 | 0.025 | HIGH |
| 22414 | -1.502 | 0.003 | 2.113 | 0.013 | HIGH |
| 22415 | 8.580 | 0.016 | 1.091 | 0.007 | HIGH |
| 23301 | 17.081 | 0.032 | 5.823 | 0.037 | HIGH |
| 23302 | -18.148 | 0.034 | 3.301 | 0.021 | HIGH |
| 23303 | -31.936 | 0.060 | 3.771 | 0.024 | HIGH |
| 23304 | 7.396 | 0.014 | 3.322 | 0.021 | HIGH |
| 23305 | -90.066 | 0.170 | 2.545 | 0.016 | 4.86 |
| 23306 | 24.430 | 0.046 | 3.801 | 0.024 | HIGH |
| 23307 | -101.359 | 0.191 | 2.552 | 0.016 | 4.21 |
| 23308 | 40.626 | 0.077 | 2.789 | 0.018 | HIGH |
| 23313 | 41.641 | 0.079 | 0.726 | 0.005 | HIGH |
| 23314 | 16.882 | 0.032 | 1.395 | 0.009 | HIGH |
| 23319 | -91.565 | 0.173 | 0.723 | 0.005 | 4.79 |
| 23320 | -85.054 | 0.160 | 0.695 | 0.004 | 5.23 |
| 23321 | 43.383 | 0.082 | 0.730 | 0.005 | HIGH |
| 23322 | 40.022 | 0.076 | 0.930 | 0.006 | HIGH |
| 23323 | 26.011 | 0.049 | 1.518 | 0.010 | HIGH |
| 23324 | -9.749 | 0.018 | 2.456 | 0.016 | HIGH |
| 23327 | -28.337 | 0.053 | 3.382 | 0.022 | HIGH |
| 23328 | -40.195 | 0.076 | 1.739 | 0.011 | HIGH |
| 23329 | -88.718 | 0.167 | 0.550 | 0.004 | 4.97 |
| 23330 | -98.188 | 0.185 | 2.038 | 0.013 | 4.38 |
| 23331 | 41.381 | 0.078 | 1.153 | 0.007 | HIGH |
| 23332 | 41.488 | 0.078 | 0.764 | 0.005 | HIGH |
| 23333 | 20.583 | 0.039 | 0.703 | 0.004 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23334 | -2.768 | 0.005 | 5.432 | 0.035 | HIGH |
| 23338 | -68.614 | 0.129 | 7.740 | 0.049 | 6.43 |
| 23339 | -68.486 | 0.129 | 2.065 | 0.013 | 6.71 |
| 23340 | -82.791 | 0.156 | 0.781 | 0.005 | 5.40 |
| 23341 | -82.140 | 0.155 | 2.252 | 0.014 | 5.43 |
| 23342 | 40.584 | 0.077 | 0.949 | 0.006 | HIGH |
| 23343 | 41.490 | 0.078 | 1.071 | 0.007 | HIGH |
| 23344 | 30.025 | 0.057 | 0.937 | 0.006 | HIGH |
| 23345 | -6.708 | 0.013 | 3.590 | 0.023 | HIGH |
| 23350 | -55.474 | 0.105 | 7.892 | 0.050 | 8.09 |
| 23351 | -58.919 | 0.111 | 2.993 | 0.019 | 7.92 |
| 23352 | -64.436 | 0.122 | 1.448 | 0.009 | 7.21 |
| 23353 | -65.741 | 0.124 | 1.312 | 0.008 | 7.05 |
| 23354 | 45.456 | 0.086 | 0.779 | 0.005 | HIGH |
| 23355 | 39.921 | 0.075 | 1.181 | 0.008 | HIGH |
| 23356 | 31.169 | 0.059 | 1.318 | 0.008 | HIGH |
| 23357 | 19.919 | 0.038 | 3.123 | 0.020 | HIGH |
| 23363 | -27.472 | 0.052 | 6.979 | 0.045 | HIGH |
| 23364 | -38.321 | 0.072 | 1.020 | 0.007 | HIGH |
| 23365 | -45.362 | 0.086 | 1.217 | 0.008 | HIGH |
| 23366 | -49.636 | 0.094 | 1.274 | 0.008 | 9.65 |
| 23367 | 43.458 | 0.082 | 4.867 | 0.031 | HIGH |
| 23368 | 33.919 | 0.064 | 1.072 | 0.007 | HIGH |
| 23369 | 29.217 | 0.055 | 1.690 | 0.011 | HIGH |
| 23370 | 25.985 | 0.049 | 1.877 | 0.012 | HIGH |
| 23371 | 34.573 | 0.065 | 4.736 | 0.030 | HIGH |
| 23376 | 1.492 | 0.003 | 7.409 | 0.047 | HIGH |
| 23377 | -12.377 | 0.023 | 1.457 | 0.009 | HIGH |
| 23378 | -21.940 | 0.041 | 0.911 | 0.006 | HIGH |
| 23379 | -28.166 | 0.053 | 0.894 | 0.006 | HIGH |
| 23380 | -32.847 | 0.062 | 0.997 | 0.006 | HIGH |
| 23382 | 50.012 | 0.094 | 4.445 | 0.028 | 9.38 |
| 23383 | 31.411 | 0.059 | 0.703 | 0.004 | HIGH |
| 23384 | 26.656 | 0.050 | 1.520 | 0.010 | HIGH |
| 23385 | 28.801 | 0.054 | 1.999 | 0.013 | HIGH |
| 23386 | 13.639 | 0.026 | 3.417 | 0.022 | HIGH |
| 23390 | 20.177 | 0.038 | 5.224 | 0.033 | HIGH |
| 23391 | 8.191 | 0.015 | 0.521 | 0.003 | HIGH |
| 23392 | -0.870 | 0.002 | 0.514 | 0.003 | HIGH |
| 23393 | -6.317 | 0.012 | 0.277 | 0.002 | HIGH |
| 23394 | -10.183 | 0.019 | 0.189 | 0.001 | HIGH |
| 23395 | -10.965 | 0.021 | 0.186 | 0.001 | HIGH |
| 23397 | -141.330 | 0.267 | 8.211 | 0.052 | 2.67 |
| 23398 | -112.495 | 0.212 | 1.518 | 0.010 | 3.70 |
| 23399 | -90.139 | 0.170 | 0.388 | 0.002 | 4.88 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23400 | -75.894 | 0.143 | 0.913 | 0.006 | 5.98 |
| 23401 | -63.605 | 0.120 | 1.092 | 0.007 | 7.32 |
| 23402 | -53.715 | 0.101 | 1.180 | 0.008 | 8.85 |
| 23403 | -57.239 | 0.108 | 8.955 | 0.057 | 7.72 |
| 23406 | -107.419 | 0.203 | 2.532 | 0.016 | 3.92 |
| 23407 | -98.992 | 0.187 | 1.371 | 0.009 | 4.35 |
| 23408 | -94.164 | 0.178 | 1.329 | 0.008 | 4.62 |
| 23409 | -85.311 | 0.161 | 1.209 | 0.008 | 5.20 |
| 23410 | -73.765 | 0.139 | 1.866 | 0.012 | 6.16 |
| 23411 | -52.833 | 0.100 | 2.008 | 0.013 | 8.98 |
| 23412 | -39.727 | 0.075 | 4.693 | 0.030 | HIGH |
| 23413 | -57.608 | 0.109 | 15.037 | 0.096 | 6.98 |
| 23415 | -93.337 | 0.176 | 3.417 | 0.022 | 4.64 |
| 23416 | -96.386 | 0.182 | 3.010 | 0.019 | 4.47 |
| 23417 | -93.013 | 0.175 | 1.285 | 0.008 | 4.69 |
| 23418 | -81.655 | 0.154 | 1.827 | 0.012 | 5.47 |
| 23419 | -44.946 | 0.085 | 1.984 | 0.013 | HIGH |
| 23420 | -15.276 | 0.029 | 3.315 | 0.021 | HIGH |
| 23421 | -0.642 | 0.001 | 1.636 | 0.010 | HIGH |
| 23424 | -96.599 | 0.182 | 6.931 | 0.044 | 4.36 |
| 23425 | -105.882 | 0.200 | 5.347 | 0.034 | 3.94 |
| 23426 | -114.223 | 0.216 | 2.687 | 0.017 | 3.62 |
| 23432 | -95.170 | 0.180 | 14.465 | 0.092 | 4.13 |
| 23433 | -104.486 | 0.197 | 6.135 | 0.039 | 3.99 |
| 23440 | -54.683 | 0.103 | 17.818 | 0.114 | 6.97 |
| 23450 | 2.913 | 0.005 | 10.586 | 0.068 | HIGH |
| 23455 | -41.737 | 0.079 | 8.826 | 0.056 | HIGH |
| 23456 | -19.776 | 0.037 | 7.256 | 0.046 | HIGH |
| 23457 | -98.323 | 0.186 | 14.831 | 0.095 | 3.96 |
| 23463 | 3.211 | 0.006 | 4.254 | 0.027 | HIGH |
| 23464 | 2.158 | 0.004 | 3.592 | 0.023 | HIGH |
| 23465 | 42.480 | 0.080 | 4.137 | 0.026 | HIGH |
| 23467 | -28.184 | 0.053 | 11.773 | 0.075 | HIGH |
| 23470 | 12.630 | 0.024 | 4.094 | 0.026 | HIGH |
| 23471 | 16.248 | 0.031 | 3.959 | 0.025 | HIGH |
| 23472 | 30.657 | 0.058 | 2.736 | 0.017 | HIGH |
| 23473 | 27.351 | 0.052 | 3.053 | 0.019 | HIGH |
| 23474 | -22.322 | 0.042 | 9.624 | 0.061 | HIGH |
| 23475 | -7.617 | 0.014 | 2.904 | 0.019 | HIGH |
| 23476 | 6.355 | 0.012 | 2.976 | 0.019 | HIGH |
| 23477 | 17.336 | 0.033 | 2.960 | 0.019 | HIGH |
| 23478 | 23.006 | 0.043 | 1.557 | 0.010 | HIGH |
| 23479 | 14.070 | 0.027 | 4.102 | 0.026 | HIGH |
| 23480 | -6.623 | 0.012 | 6.728 | 0.043 | HIGH |
| 23481 | 2.812 | 0.005 | 2.440 | 0.016 | HIGH |

42.5.5.74

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23482 | 12.522 | 0.024 | 2.268 | 0.014 | HIGH |
| 23483 | 19.718 | 0.037 | 2.110 | 0.013 | HIGH |
| 23484 | 13.783 | 0.026 | 3.661 | 0.023 | HIGH |
| 23485 | 3.029 | 0.006 | 4.141 | 0.026 | HIGH |
| 23486 | 9.343 | 0.018 | 1.704 | 0.011 | HIGH |
| 23487 | 15.738 | 0.030 | 1.685 | 0.011 | HIGH |
| 23488 | 14.075 | 0.027 | 1.622 | 0.010 | HIGH |
| 23489 | 8.042 | 0.015 | 2.005 | 0.013 | HIGH |
| 23490 | 12.832 | 0.024 | 1.164 | 0.007 | HIGH |
| 23491 | 13.095 | 0.025 | 1.129 | 0.007 | HIGH |
| 23492 | 12.897 | 0.024 | 0.436 | 0.003 | HIGH |
| 23493 | 12.675 | 0.024 | 2.195 | 0.014 | HIGH |
| 23494 | 16.638 | 0.031 | 1.454 | 0.009 | HIGH |
| 23499 | -13.649 | 0.026 | 5.812 | 0.037 | HIGH |
| 23500 | -23.876 | 0.045 | 1.087 | 0.007 | HIGH |
| 23501 | -17.312 | 0.033 | 1.143 | 0.007 | HIGH |
| 23502 | -16.752 | 0.032 | 0.961 | 0.006 | HIGH |
| 23503 | -15.083 | 0.028 | 0.457 | 0.003 | HIGH |
| 23504 | -11.771 | 0.022 | 0.078 | 0.001 | HIGH |
| 23505 | -8.832 | 0.017 | 0.246 | 0.002 | HIGH |
| 23506 | -9.729 | 0.018 | 0.256 | 0.002 | HIGH |
| 23509 | -85.579 | 0.161 | 4.062 | 0.026 | 5.13 |
| 23510 | -43.450 | 0.082 | 2.299 | 0.015 | HIGH |
| 23511 | -29.018 | 0.055 | 2.222 | 0.014 | HIGH |
| 23512 | -23.327 | 0.044 | 1.726 | 0.011 | HIGH |
| 23513 | -16.119 | 0.030 | 0.702 | 0.004 | HIGH |
| 23514 | -9.716 | 0.018 | 1.070 | 0.007 | HIGH |
| 23515 | -4.769 | 0.009 | 1.105 | 0.007 | HIGH |
| 23518 | -75.735 | 0.143 | 0.661 | 0.004 | 5.99 |
| 23519 | -35.576 | 0.067 | 3.595 | 0.023 | HIGH |
| 23520 | -37.089 | 0.070 | 2 697 | 0.017 | HIGH |
| 23521 | -33.453 | 0.063 | 2.559 | 0.016 | HIGH |
| 23522 | -22.479 | 0.042 | 2.178 | 0.014 | HIGH |
| 23523 | -12.748 | 0.024 | 2.488 | 0.016 | HIGH |
| 23524 | -6.585 | 0.012 | 2.584 | 0.016 | HIGH |
| 23530 | -28.557 | 0.054 | 4.080 | 0.026 | HIGH |
| 23531 | -14.553 | 0.027 | 3.578 | 0.023 | HIGH |
| 23532 | -5.671 | 0.011 | 4.524 | 0.029 | HIGH |
| 23539 | -11.893 | 0.022 | 8.244 | 0.053 | HIGH |
| 23540 | 0.438 | 0.001 | 8.776 | 0.056 | HIGH |
| 23550 | 19.317 | 0.036 | 17.727 | 0.113 | HIGH |
| 23553 | -50.332 | 0.095 | 7.133 | 0.046 | 9.05 |
| 23554 | -26.656 | 0.050 | 7.267 | 0.046 | HIGH |
| 23559 | 35.162 | 0.066 | 19.236 | 0.123 | 9.89 |
| 23561 | -30.995 | 0.058 | 3.707 | 0.024 | HIGH |

5.5.75

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23562 | -14.875 | 0.028 | 2.784 | 0.018 | HIGH |
| 23563 | 12.894 | 0.024 | 3.530 | 0.023 | HIGH |
| 23568 | 5.378 | 0.010 | 2.402 | 0.015 | HIGH |
| 23569 | 10.255 | 0.019 | 1.977 | 0.013 | HIGH |
| 23570 | 31.284 | 0.059 | 2.459 | 0.016 | HIGH |
| 23571 | 68.018 | 0.128 | 2.453 | 0.016 | 6.75 |
| 23574 | -2.219 | 0.004 | 8.998 | 0.057 | HIGH |
| 23575 | 30.069 | 0.057 | 1.911 | 0.012 | HIGH |
| 23576 | 30.314 | 0.057 | 1.077 | 0.007 | HIGH |
| 23577 | 41.959 | 0.079 | 1.667 | 0.011 | HIGH |
| 23578 | 53.385 | 0.101 | 1.653 | 0.011 | 8.89 |
| 23579 | 45.093 | 0.085 | 1.565 | 0.010 | HIGH |
| 23580 | 20.186 | 0.038 | 8.250 | 0.053 | HIGH |
| 23581 | 38.014 | 0.072 | 1.413 | 0.009 | HIGH |
| 23582 | 38.310 | 0.072 | 1.416 | 0.009 | HIGH |
| 23583 | 47.265 | 0.089 | 1.549 | 0.010 | HIGH |
| 23584 | 50.735 | 0.096 | 2.489 | 0.016 | 9.37 |
| 23585 | 38.835 | 0.073 | 11.846 | 0.076 | HIGH |
| 23586 | 40.991 | 0.077 | 0.766 | 0.005 | HIGH |
| 23587 | 47.679 | 0.090 | 1.535 | 0.010 | HIGH |
| 23588 | 52.616 | 0.099 | 2.015 | 0.013 | 9.02 |
| 23589 | 47.510 | 0.090 | 10.450 | 0.067 | 9.16 |
| 23590 | 48.805 | 0.092 | 1.813 | 0.012 | 9.81 |
| 23591 | 60.481 | 0.114 | 3.123 | 0.020 | 7.68 |
| 23592 | 67.137 | 0.127 | 5.665 | 0.036 | 6.71 |
| 23594 | 139.913 | 0.264 | 9.472 | 0.060 | 2.69 |
| 32201 | -17.453 | 0.033 | 1.126 | 0.007 | HIGH |
| 32202 | -38.328 | 0.072 | 1.375 | 0.009 | HIGH |
| 32204 | 13.893 | 0.026 | 0.850 | 0.005 | HIGH |
| 32205 | 0.256 | 0.000 | 0.590 | 0.004 | HIGH |
| 32206 | 56.410 | 0.106 | 1.373 | 0.009 | 8.37 |
| 32207 | 1.650 | 0.003 | 0.851 | 0.005 | HIGH |
| 32208 | 78.181 | 0.148 | 1.480 | 0.009 | 5.77 |
| 32215 | -50.545 | 0.095 | 4.399 | 0.028 | 9.28 |
| 32216 | -33.876 | 0.064 | 0.352 | 0.002 | HIGH |
| 32222 | -9.221 | 0.017 | 2.357 | 0.015 | HIGH |
| 32223 | -25.047 | 0.047 | 5.731 | 0.037 | HIGH |
| 32224 | -64.289 | 0.121 | 20.248 | 0.129 | 5.70 |
| 32225 | -50.504 | 0.095 | 5.751 | 0.037 | 9.17 |
| 32226 | -2.509 | 0.005 | 0.582 | 0.004 | HIGH |
| 32227 | 22.723 | 0.043 | 0.099 | 0.001 | HIGH |
| 32228 | 13.017 | 0.025 | 0.040 | 0.000 | HIGH |
| 32229 | 6.317 | 0.012 | 1.663 | 0.011 | HIGH |
| 32230 | 6.974 | 0.013 | 2.102 | 0.013 | HIGH |
| 32231 | 5.581 | 0.011 | 0.832 | 0.005 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32232 | -26.991 | 0.051 | 1.672 | 0.011 | HIGH |
| 32233 | -38.831 | 0.073 | 11 242 | 0.072 | HIGH |
| 32234 | -50.765 | 0.096 | 23.116 | 0.148 | 6.64 |
| 32235 | -10.417 | 0.020 | 9.999 | 0.064 | HIGH |
| 32236 | -9.696 | 0.018 | 0.801 | 0.005 | HIGH |
| 32237 | -1.071 | 0.002 | 0.589 | 0.004 | HIGH |
| 32238 | 10.908 | 0.021 | 0.751 | 0.005 | HIGH |
| 32239 | 1.893 | 0.004 | 0.449 | 0.003 | HIGH |
| 32240 | -0.738 | 0.001 | 0.287 | 0.002 | HIGH |
| 32241 | -2.607 | 0.005 | 0.720 | 0.005 | HIGH |
| 32242 | -14.746 | 0.028 | 0.734 | 0.005 | HIGH |
| 32243 | -27.261 | 0.051 | 3.501 | 0.022 | HIGH |
| 32244 | -21.507 | 0.041 | 10.827 | 0.069 | HIGH |
| 32245 | -3.520 | 0.007 | 11.616 | 0.074 | HIGH |
| 32246 | 1.226 | 0.002 | 8.063 | 0.051 | HIGH |
| 32247 | -4.122 | 0.008 | 1.314 | 0.008 | HIGH |
| 32248 | -0.665 | 0.001 | 0.552 | 0.004 | HIGH |
| 32249 | 10.054 | 0.019 | 2.407 | 0.015 | HIGH |
| 32250 | 0.697 | 0.001 | 0.838 | 0.005 | HIGH |
| 32251 | -1.655 | 0.003 | 0.615 | 0.004 | HIGH |
| 32252 | -3.616 | 0.007 | 0.694 | 0.004 | HIGH |
| 32253 | -7.138 | 0.013 | 0.744 | 0.005 | HIGH |
| 32254 | -8.094 | 0.015 | 1.896 | 0.012 | HIGH |
| 32255 | -22.846 | 0.043 | 1.794 | 0.011 | HIGH |
| 32256 | -28.983 | 0.055 | 1.604 | 0.010 | HIGH |
| 32257 | -4.820 | 0.009 | 5.704 | 0.036 | HIGH |
| 32258 | 7.848 | 0.015 | 3.887 | 0.025 | HIGH |
| 32259 | 1.152 | 0.002 | 5.829 | 0.037 | HIGH |
| 32260 | 4.956 | 0.009 | 3.213 | 0.021 | HIGH |
| 32261 | 9.315 | 0.018 | 9.983 | 0.064 | HIGH |
| 32262 | 3.671 | 0.007 | 1.373 | 0.009 | HIGH |
| 32263 | 0.936 | 0.002 | 0.926 | 0.006 | HIGH |
| 32264 | -1.026 | 0.002 | 0.365 | 0.002 | HIGH |
| 32265 | -5.070 | 0.010 | 0.718 | 0.005 | HIGH |
| 32266 | -6.423 | 0.012 | 0.595 | 0.004 | HIGH |
| 32267 | -12.808 | 0.024 | 0.739 | 0.005 | HIGH |
| 32268 | -14.435 | 0.027 | 0.675 | 0.004 | HIGH |
| 32269 | -23.928 | 0.045 | 0.648 | 0.004 | HIGH |
| 32270 | 29.533 | 0.056 | 6.315 | 0.040 | HIGH |
| 32271 | 19.530 | 0.037 | 2.081 | 0.013 | HIGH |
| 32272 | 16.427 | 0.031 | 2.889 | 0.018 | HIGH |
| 32273 | 16.654 | 0.031 | 2.506 | 0.016 | HIGH |
| 32274 | 36.682 | 0.069 | 3.207 | 0.020 | HIGH |
| 32275 | -2.694 | 0.005 | 0.200 | 0.001 | HIGH |
| 32278 | 30.920 | 0.058 | 0.979 | 0.006 | HIGH |

5.5.77

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32279 | 43.675 | 0.082 | 1.602 | 0.010 | HIGH |
| 32280 | 2.358 | 0.004 | 0.088 | 0.001 | HIGH |
| 32281 | 33.756 | 0.064 | 0.324 | 0.002 | HIGH |
| 32282 | 18.152 | 0.034 | 0.528 | 0.003 | HIGH |
| 32283 | -3.690 | 0.007 | 2.771 | 0.018 | HIGH |
| 32286 | 48.642 | 0.092 | 6.696 | 0.043 | 9.44 |
| 32287 | 42.930 | 0.081 | 0.638 | 0.004 | HIGH |
| 32288 | 35.454 | 0.067 | 0.447 | 0.003 | HIGH |
| 32289 | 31.645 | 0.060 | 0.127 | 0.001 | HIGH |
| 32290 | 31.120 | 0.059 | 0.770 | 0.005 | HIGH |
| 32293 | 33.976 | 0.064 | 17.117 | 0.109 | HIGH |
| 32294 | 45.804 | 0.086 | 2.455 | 0.016 | HIGH |
| 32295 | 1.878 | 0.004 | 0.159 | 0.001 | HIGH |
| 32296 | 53.822 | 0.102 | 0.196 | 0.001 | 8.85 |
| 32297 | 69.997 | 0.132 | 0.466 | 0.003 | 6.57 |
| 32300 | 41.797 | 0.079 | 18.717 | 0.120 | 8.69 |
| 32301 | 48.855 | 0.092 | 0.644 | 0.004 | 9.84 |
| 32302 | 53.751 | 0.101 | 0.208 | 0.001 | 8.86 |
| 32303 | 63.145 | 0.119 | 0.409 | 0.003 | 7.39 |
| 32304 | 69.791 | 0.132 | 0.671 | 0.004 | 6.59 |
| 32308 | 58.038 | 0.110 | 7.313 | 0.047 | 7.76 |
| 32309 | 61.368 | 0.116 | 1.012 | 0.006 | 7.63 |
| 32310 | 63.812 | 0.120 | 0.187 | 0.001 | 7.31 |
| 32311 | 66.528 | 0.126 | 2.260 | 0.014 | 6.93 |
| 32312 | 48.748 | 0.092 | 1.809 | 0.012 | 9.82 |
| 32316 | 61.229 | 0.116 | 3.864 | 0.025 | 7.54 |
| 32317 | 63.849 | 0.120 | 0.785 | 0.005 | 7.29 |
| 32318 | 65.877 | 0.124 | 0.156 | 0.001 | 7.04 |
| 32319 | 67.818 | 0.128 | 0.463 | 0.003 | 6.81 |
| 32320 | 67.200 | 0.127 | 1.423 | 0.009 | 6.87 |
| 32323 | 60.372 | 0.114 | 2.032 | 0.013 | 7.74 |
| 32324 | 65.023 | 0.123 | 0.237 | 0.002 | 7.15 |
| 32325 | 68.608 | 0.129 | 0.329 | 0.002 | 6.72 |
| 32326 | 80.762 | 0.152 | 0.388 | 0.002 | 5.56 |
| 32327 | 75.985 | 0.143 | 1.869 | 0.012 | 5.95 |
| 32329 | 62.469 | 0.118 | 2.337 | 0.015 | 7.44 |
| 32330 | 64.215 | 0.121 | 0.686 | 0.004 | 7.25 |
| 32331 | 65.199 | 0.123 | 0.581 | 0.004 | 7.13 |
| 32332 | 77.501 | 0.146 | 2.559 | 0.016 | 5.80 |
| 32333 | 80.468 | 0.152 | 12.399 | 0.079 | 5.11 |
| 32334 | 56.397 | 0.106 | 3.296 | 0.021 | 8.30 |
| 32335 | 63.467 | 0.120 | 1.294 | 0.008 | 7.34 |
| 32336 | 34.808 | 0.066 | 1.323 | 0.008 | HIGH |
| 32337 | 78.179 | 0.148 | 12.439 | 0.079 | 5.27 |
| 32338 | 37.033 | 0.070 | 1.506 | 0.010 | HIGH |

87.5.5

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32339 | 39.010 | 0.074 | 0.668 | 0.004 | HIGH |
| 32340 | 47.643 | 0.090 | 5.151 | 0.033 | 9.82 |
| 32341 | 15.249 | 0.029 | 0.402 | 0.003 | HIGH |
| 32342 | 25.693 | 0.048 | 0.395 | 0.003 | HIGH |
| 32343 | 2.572 | 0.005 | 0.587 | 0.004 | HIGH |
| 32346 | 22.430 | 0.042 | 4.947 | 0.032 | HIGH |
| 32347 | -3.229 | 0.006 | 2.902 | 0.019 | HIGH |
| 32348 | -19.693 | 0.037 | 4.745 | 0.030 | HIGH |
| 32349 | -12.102 | 0.023 | 0.958 | 0.006 | HIGH |
| 32350 | -8.572 | 0.016 | 2.748 | 0.018 | HIGH |
| 32351 | 1.062 | 0.002 | 0.227 | 0.001 | HIGH |
| 32353 | -13.131 | 0.025 | 1.828 | 0.012 | HIGH |
| 32354 | -25.214 | 0.048 | 1.622 | 0.010 | HIGH |
| 32355 | -47.923 | 0.090 | 2.184 | 0.014 | 9.99 |
| 32356 | -35.276 | 0.067 | 2.363 | 0.015 | HIGH |
| 32357 | -22.350 | 0.042 | 1.031 | 0.007 | HIGH |
| 32358 | -20.452 | 0.039 | 0.895 | 0.006 | HIGH |
| 32361 | -43.417 | 0.082 | 1.093 | 0.007 | HIGH |
| 32362 | -55.512 | 0.105 | 1.230 | 0.008 | 8.53 |
| 32363 | -43.404 | 0.082 | 1.256 | 0.008 | HIGH |
| 32364 | -42.289 | 0.080 | 1.234 | 0.008 | HIGH |
| 32365 | -35.279 | 0.067 | 0.817 | 0.005 | HIGH |
| 32368 | -50.077 | 0.094 | 0.527 | 0.003 | 9.58 |
| 32369 | -52.588 | 0.099 | 0.485 | 0.003 | 9.07 |
| 32370 | -50.683 | 0.096 | 1.138 | 0.007 | 9.44 |
| 32371 | -47.049 | 0.089 | 1.190 | 0.008 | HIGH |
| 32372 | -45.024 | 0.085 | 2.339 | 0.015 | HIGH |
| 32375 | -65.241 | 0.123 | 0.151 | 0.001 | 7.12 |
| 32376 | -58.733 | 0.111 | 0.313 | 0.002 | 8.02 |
| 32377 | -56.007 | 0.106 | 1.151 | 0.007 | 8.45 |
| 32378 | -53.913 | 0.102 | 1.210 | 0.008 | 8.81 |
| 32379 | -49.130 | 0.093 | 3.607 | 0.023 | 9.63 |
| 32383 | -83.943 | 0.158 | 0.077 | 0.000 | 5.31 |
| 32384 | -73.538 | 0.139 | 0.450 | 0.003 | 6.21 |
| 32385 | -64.396 | 0.122 | 0.712 | 0.005 | 7.22 |
| 32386 | -61.907 | 0.117 | 1.638 | 0.010 | 7.54 |
| 32387 | -59.347 | 0.112 | 1.556 | 0.010 | 7.91 |
| 32390 | -60.077 | 0.113 | 0.357 | 0.002 | 7.82 |
| 32391 | -60.965 | 0.115 | 0.397 | 0.003 | 7.69 |
| 32392 | -76.107 | 0.144 | 0.843 | 0.005 | 5.96 |
| 32393 | -66.560 | 0.126 | 2.878 | 0.018 | 6.90 |
| 32394 | -63.102 | 0.119 | 3.246 | 0.021 | 7.32 |
| 32396 | -44.470 | 0.084 | 0.719 | 0.005 | HIGH |
| 32397 | -74.342 | 0.140 | 0.223 | 0.001 | 6.13 |
| 32398 | -82.514 | 0.156 | 0.562 | 0.004 | 5.42 |

S.S.79

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32399 | -62.402 | 0.118 | 1.746 | 0.011 | 7.47 |
| 32400 | -56.714 | 0.107 | 7.436 | 0.047 | 7.94 |
| 32401 | -60.035 | 0.113 | 5.461 | 0.035 | 7.61 |
| 32402 | -108.479 | 0.205 | 6.359 | 0.041 | 3.80 |
| 32403 | -89.813 | 0.169 | 0.537 | 0.003 | 4.90 |
| 32404 | -92.549 | 0.175 | 1.752 | 0.011 | 4.71 |
| 32405 | -35.697 | 0.067 | 54.099 | 0.345 | 3.48 |
| 32406 | -104.832 | 0.198 | 13.477 | 0.086 | 3.73 |
| 32407 | -94.411 | 0.178 | 6.009 | 0.038 | 4.51 |
| 32408 | -81.064 | 0.153 | 1.911 | 0.012 | 5.52 |
| 32409 | -89.818 | 0.169 | 15.116 | 0.097 | 4.37 |
| 32410 | -90.443 | 0.171 | 21.408 | 0.137 | 3.97 |
| 32411 | -79.537 | 0.150 | 3.141 | 0.020 | 5.62 |
| 32412 | -75.088 | 0.142 | 2.892 | 0.018 | 6.01 |
| 32413 | -42.586 | 0.080 | 15.773 | 0.101 | 9.17 |
| 32414 | -52.248 | 0.099 | 2.599 | 0.017 | 9.07 |
| 32415 | -9.544 | 0.018 | 12.923 | 0.083 | HIGH |
| 32425 | 4.488 | 0.008 | 1.797 | 0.011 | HIGH |
| 32426 | -67.116 | 0.127 | 0.665 | 0.004 | 6.89 |
| 32427 | -13.533 | 0.026 | 1.141 | 0.007 | HIGH |
| 32443 | -1.150 | 0.002 | 0.572 | 0.004 | HIGH |
| 32444 | -0.613 | 0.001 | 4.661 | 0.030 | HIGH |
| 32445 | -89.972 | 0.170 | 4.531 | 0.029 | 4.82 |
| 32446 | -4.620 | 0.009 | 7.591 | 0.048 | HIGH |
| 32447 | -32.139 | 0.061 | 26.923 | 0.172 | 8.39 |
| 32463 | -40.769 | 0.077 | 1.662 | 0.011 | HIGH |
| 32464 | 5.823 | 0.011 | 0.731 | 0.005 | HIGH |
| 32465 | -37.635 | 0.071 | 1.296 | 0.008 | HIGH |
| 33301 | 7.550 | 0.014 | 2.393 | 0.015 | HIGH |
| 33302 | -119.380 | 0.225 | 1.903 | 0.012 | 3.43 |
| 33303 | -122.071 | 0.230 | 2.964 | 0.019 | 3.32 |
| 33304 | 77.233 | 0.146 | 3.052 | 0.019 | 5.81 |
| 33305 | -113.182 | 0.214 | 1.791 | 0.011 | 3.67 |
| 33306 | 64.416 | 0.122 | 4.789 | 0.031 | 7.08 |
| 33307 | -67.815 | 0.128 | 0.340 | 0.002 | 6.81 |
| 33308 | 5.078 | 0.010 | 3.591 | 0.023 | HIGH |
| 33313 | 47.080 | 0.089 | 0.522 | 0.003 | HIGH |
| 33314 | 46.074 | 0.087 | 0.710 | 0.005 | HIGH |
| 33319 | -84.447 | 0.159 | 2.306 | 0.015 | 5.25 |
| 33320 | -24.434 | 0.046 | 2.483 | 0.016 | HIGH |
| 33321 | 77.262 | 0.146 | 2.019 | 0.013 | 5.84 |
| 33322 | 73.240 | 0.138 | 0.516 | 0.003 | 6.23 |
| 33323 | 73.790 | 0.139 | 0.794 | 0.005 | 6.18 |
| 33324 | -57.926 | 0.109 | 1.402 | 0.009 | 8.13 |
| 33327 | 20.880 | 0.039 | 6.355 | 0.041 | HIGH |

08.5.5

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33328 | -56.313 | 0.106 | 3.887 | 0.025 | 8.28 |
| 33329 | -62.015 | 0.117 | 2.145 | 0.014 | 7.51 |
| 33330 | -28.320 | 0.053 | 4.913 | 0.031 | HIGH |
| 33331 | 71.907 | 0.136 | 1.968 | 0.013 | 6.35 |
| 33332 | 52.079 | 0.098 | 1.453 | 0.009 | 9.15 |
| 33333 | 65.565 | 0.124 | 0.482 | 0.003 | 7.08 |
| 33334 | -15.983 | 0.030 | 2.912 | 0.019 | HIGH |
| 33338 | -44.364 | 0.084 | 15.154 | 0.097 | 8.95 |
| 33339 | -67.548 | 0.127 | 4.730 | 0.030 | 6.71 |
| 33340 | -32.488 | 0.061 | 2.068 | 0.013 | HIGH |
| 33341 | -26.919 | 0.051 | 4.920 | 0.031 | HIGH |
| 33342 | 63.820 | 0.120 | 2.056 | 0.013 | 7.27 |
| 33343 | 36.516 | 0.069 | 2.190 | 0.014 | HIGH |
| 33344 | 34.448 | 0.065 | 1.451 | 0.009 | HIGH |
| 33345 | 31.891 | 0.060 | 3.238 | 0.021 | HIGH |
| 33350 | -70.937 | 0.134 | 15.260 | 0.097 | 5.63 |
| 33351 | -30.238 | 0.057 | 5.702 | 0.036 | HIGH |
| 33352 | -11.706 | 0.022 | 3.022 | 0.019 | HIGH |
| 33353 | -9.787 | 0.018 | 3.253 | 0.021 | HIGH |
| 33354 | 54.654 | 0.103 | 2.035 | 0.013 | 8.65 |
| 33355 | 30.041 | 0.057 | 2.433 | 0.016 | HIGH |
| 33356 | 27.054 | 0.051 | 2.509 | 0.016 | HIGH |
| 33357 | 11.658 | 0.022 | 5.168 | 0.033 | HIGH |
| 33363 | -20.506 | 0.039 | 11.935 | 0.076 | HIGH |
| 33364 | -15.963 | 0.030 | 1.924 | 0.012 | HIGH |
| 33365 | 6.596 | 0.012 | 2.199 | 0.014 | HIGH |
| 33366 | 34.501 | 0.065 | 2.428 | 0.016 | HIGH |
| 33367 | 41.856 | 0.079 | 2.145 | 0.014 | HIGH |
| 33368 | 23.670 | 0.045 | 2.086 | 0.013 | HIGH |
| 33369 | 21.141 | 0.040 | 2.116 | 0.014 | HIGH |
| 33370 | 17.687 | 0.033 | 2.507 | 0.016 | HIGH |
| 33371 | -15.999 | 0.030 | 9.021 | 0.058 | HIGH |
| 33376 | 12.574 | 0.024 | 10.845 | 0.069 | HIGH |
| 33377 | -24.075 | 0.045 | 2.600 | 0.017 | HIGH |
| 33378 | -11.525 | 0.022 | 2.462 | 0.016 | HIGH |
| 33379 | 17.338 | 0.033 | 2.568 | 0.016 | HIGH |
| 33380 | 74.557 | 0.141 | 7.736 | 0.049 | 5.86 |
| 33381 | 21.246 | 0.040 | 1.915 | 0.012 | HIGH |
| 33382 | 14.403 | 0.027 | 1.296 | 0.008 | HIGH |
| 33383 | 9.169 | 0.017 | 0.995 | 0.006 | HIGH |
| 33384 | 4.915 | 0.009 | 0.841 | 0.005 | HIGH |
| 33385 | 2.605 | 0.005 | 2.210 | 0.014 | HIGH |
| 33386 | 5.485 | 0.010 | 8.291 | 0.053 | HIGH |
| 33390 | -20.969 | 0.040 | 7.217 | 0.046 | HIGH |
| 33391 | -13.940 | 0.026 | 0.767 | 0.005 | HIGH |

18.5.5

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33392 | -26.815 | 0.051 | 1.374 | 0.009 | HIGH |
| 33393 | -8.057 | 0.015 | 3.140 | 0.020 | HIGH |
| 33394 | 8.180 | 0.015 | 10.192 | 0.065 | HIGH |
| 33396 | 12.441 | 0.023 | 1.924 | 0.012 | HIGH |
| 33397 | 9.266 | 0.017 | 2.068 | 0.013 | HIGH |
| 33398 | 8.113 | 0.015 | 1.168 | 0.007 | HIGH |
| 33399 | 7.466 | 0.014 | 0.397 | 0.003 | HIGH |
| 33400 | 4.460 | 0.008 | 0.762 | 0.005 | HIGH |
| 33401 | -10.326 | 0.019 | 0.829 | 0.005 | HIGH |
| 33402 | -43.854 | 0.083 | 0.839 | 0.005 | HIGH |
| 33403 | -118.782 | 0.224 | 3.848 | 0.025 | 3.43 |
| 33406 | 4.967 | 0.009 | 5.317 | 0.034 | HIGH |
| 33407 | 15.087 | 0.028 | 3.741 | 0.024 | HIGH |
| 33408 | 17.621 | 0.033 | 2.320 | 0.015 | HIGH |
| 33409 | 20.603 | 0.039 | 1.650 | 0.011 | HIGH |
| 33410 | 22.671 | 0.043 | 1.757 | 0.011 | HIGH |
| 33411 | 9.260 | 0.017 | 1.776 | 0.011 | HIGH |
| 33412 | -6.245 | 0.012 | 2.621 | 0.017 | HIGH |
| 33413 | -110.211 | 0.208 | 10.797 | 0.069 | 3.60 |
| 33415 | 21.943 | 0.041 | 7.407 | 0.047 | HIGH |
| 33416 | 32.967 | 0.062 | 6.383 | 0.041 | HIGH |
| 33417 | 36.434 | 0.069 | 2.478 | 0.016 | HIGH |
| 33418 | 51.764 | 0.098 | 2.337 | 0.015 | 9.17 |
| 33419 | 54.296 | 0.102 | 2.248 | 0.014 | 8.70 |
| 33420 | 45.640 | 0.086 | 2.701 | 0.017 | HIGH |
| 33421 | 67.890 | 0.128 | 2.141 | 0.014 | HIGH |
| 33424 | 42.202 | 0.080 | 11.306 | 0.072 | 6.77 |
| 33425 | 53.506 | 0.101 | 10.253 | 0.065 | HIGH |
| 33426 | 87.041 | 0.164 | 4.419 | 0.028 | 8.14 |
| 33432 | 24.855 | 0.047 | 22.273 | 0.142 | 5.02 |
| 33433 | 34.683 | 0.065 | 12.373 | 0.079 | HIGH |
| 33440 | 1.735 | 0.003 | 47.490 | 0.303 | HIGH |
| 33450 | -1.861 | 0.004 | 27.519 | 0.176 | 6.86 |
| 33455 | 25.273 | 0.048 | 15.954 | 0.102 | HIGH |
| 33456 | 81.817 | 0.154 | 8.833 | 0.056 | HIGH |
| 33457 | -23.586 | 0.045 | 16.183 | 0.103 | 5.22 |
| 33463 | 121.732 | 0.230 | 7.913 | 0.051 | HIGH |
| 33464 | 103.986 | 0.196 | 6.790 | 0.043 | 3.25 |
| 33465 | 100.524 | 0.190 | 6.093 | 0.039 | 3.99 |
| 33467 | 13.456 | 0.025 | 17.035 | 0.109 | 4.18 |
| 33470 | 174.446 | 0.329 | 7.786 | 0.050 | HIGH |
| 33471 | 134.124 | 0.253 | 7.447 | 0.048 | 1.99 |
| 33472 | 99.274 | 0.187 | 4.060 | 0.026 | 2.88 |
| 33473 | 56.122 | 0.106 | 4.812 | 0.031 | 4.29 |
| 33474 | 42.881 | 0.081 | 14.858 | 0.095 | 8.25 |
| | | | | | 9.30 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33475 | 90.186 | 0.170 | 4.078 | 0.026 | 4.82 |
| 33476 | 126.682 | 0.239 | 5.393 | 0.034 | 3.14 |
| 33477 | 122.234 | 0.231 | 5.393 | 0.034 | 3.28 |
| 33478 | 103.842 | 0.196 | 3.149 | 0.020 | 4.08 |
| 33479 | 85.979 | 0.162 | 7.901 | 0.050 | 4.97 |
| 33480 | 104.392 | 0.197 | 10.886 | 0.070 | 3.85 |
| 33481 | 133.794 | 0.252 | 3.969 | 0.025 | 2.94 |
| 33482 | 121.368 | 0.229 | 4.245 | 0.027 | 3.33 |
| 33483 | 98.980 | 0.187 | 4.087 | 0.026 | 4.31 |
| 33484 | 86.033 | 0.162 | 7.091 | 0.045 | 5.00 |
| 33485 | 132.234 | 0.249 | 7.119 | 0.045 | 2.94 |
| 33486 | 133.647 | 0.252 | 4.705 | 0.030 | 2.93 |
| 33487 | 104.989 | 0.198 | 4.798 | 0.031 | 3.99 |
| 33488 | 71.672 | 0.135 | 4.438 | 0.028 | 6.29 |
| 33489 | 127.940 | 0.241 | 9.666 | 0.062 | 3.02 |
| 33490 | 132.609 | 0.250 | 7.728 | 0.049 | 2.92 |
| 33491 | 73.700 | 0.139 | 4.439 | 0.028 | 6.09 |
| 33492 | 232.133 | 0.438 | 23.774 | 0.152 | 1.11 |
| 33499 | 70.626 | 0.133 | 4.814 | 0.031 | 6.38 |
| 33500 | -10.534 | 0.020 | 1.779 | 0.011 | HIGH |
| 33501 | -60.006 | 0.113 | 1.920 | 0.012 | 7.80 |
| 33502 | -90.798 | 0.171 | 1.534 | 0.010 | 4.83 |
| 33503 | -119.428 | 0.225 | 0.585 | 0.004 | 3.44 |
| 33504 | -173.087 | 0.327 | 2.721 | 0.017 | 2.05 |
| 33505 | -259.489 | 0.490 | 15.704 | 0.100 | 0.97 |
| 33509 | -72.085 | 0.136 | 3.871 | 0.025 | 6.27 |
| 33510 | -76.634 | 0.145 | 3.827 | 0.024 | 5.84 |
| 33511 | -111.373 | 0.210 | 3.776 | 0.024 | 3.73 |
| 33512 | -129.669 | 0.245 | 2.511 | 0.016 | 3.08 |
| 33513 | -151.974 | 0.287 | 1.534 | 0.010 | 2.48 |
| 33514 | -180.545 | 0.341 | 1.414 | 0.009 | 1.93 |
| 33515 | -178.145 | 0.336 | 6.420 | 0.041 | 1.94 |
| 33518 | -122.194 | 0.231 | 1.066 | 0.007 | 3.33 |
| 33519 | -73.944 | 0.140 | 6.616 | 0.042 | 5.97 |
| 33520 | -110.288 | 0.208 | 4.672 | 0.030 | 3.76 |
| 33521 | -150.704 | 0.284 | 4.334 | 0.028 | 2.49 |
| 33522 | -155.097 | 0.293 | 3.070 | 0.020 | 2.41 |
| 33523 | -167.430 | 0.316 | 3.656 | 0.023 | 2.15 |
| 33524 | -167.606 | 0.316 | 5.551 | 0.035 | 2.13 |
| 33530 | -205.028 | 0.387 | 6.822 | 0.044 | 1.56 |
| 33531 | -168.473 | 0.318 | 5.812 | 0.037 | 2.12 |
| 33532 | -140.680 | 0.265 | 8.052 | 0.051 | 2.69 |
| 33539 | -142.595 | 0.269 | 11.906 | 0.076 | 2.57 |
| 33540 | -115.162 | 0.217 | 13.954 | 0.089 | 3.31 |
| 33550 | -58.061 | 0.110 | 26.589 | 0.170 | 5.47 |

5.5.83

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33553 | -204.518 | 0.386 | 5.399 | 0.034 | 1.57 |
| 33554 | -138.563 | 0.261 | 5.342 | 0.034 | 2.79 |
| 33559 | -4.684 | 0.009 | 24.933 | 0.159 | HIGH |
| 33561 | -196.345 | 0.370 | 2.542 | 0.016 | 1.69 |
| 33562 | -203.295 | 0.384 | 1.702 | 0.011 | 1.60 |
| 33563 | -183.617 | 0.346 | 2.693 | 0.017 | 1.88 |
| 33568 | -141.405 | 0.267 | 1.920 | 0.012 | 2.74 |
| 33569 | -156.585 | 0.295 | 1.602 | 0.010 | 2.38 |
| 33570 | -169.839 | 0.320 | 1.787 | 0.011 | 2.12 |
| 33571 | -167.001 | 0.315 | 2.558 | 0.016 | 2.17 |
| 33574 | -25.406 | 0.048 | 22.152 | 0.141 | HIGH |
| 33575 | -124.389 | 0.235 | 2.435 | 0.016 | 3.25 |
| 33576 | -125.119 | 0.236 | 0.773 | 0.006 | 3.23 |
| 33577 | -122.883 | 0.232 | 1.436 | 0.009 | 3.31 |
| 33578 | -107.368 | 0.203 | 1.682 | 0.011 | 3.93 |
| 33579 | -73.666 | 0.139 | 3.098 | 0.020 | 6.14 |
| 33580 | -61.367 | 0.116 | 26.287 | 0.168 | 5.26 |
| 33581 | -108.223 | 0.204 | 1.790 | 0.011 | 3.89 |
| 33582 | -99.360 | 0.187 | 0.924 | 0.006 | 4.33 |
| 33583 | -96.198 | 0.182 | 0.999 | 0.006 | 4.51 |
| 33584 | -92.568 | 0.175 | 3.077 | 0.020 | 4.69 |
| 33585 | -83.032 | 0.157 | 19.998 | 0.128 | 4.44 |
| 33586 | -88.077 | 0.166 | 0.575 | 0.004 | 5.02 |
| 33587 | -78.918 | 0.149 | 0.831 | 0.005 | 5.71 |
| 33588 | -76.200 | 0.144 | 4.440 | 0.028 | 5.86 |
| 33589 | -67.133 | 0.127 | 10.095 | 0.064 | 6.41 |
| 33590 | -67.881 | 0.128 | 2.333 | 0.015 | 6.77 |
| 33591 | -61.637 | 0.116 | 4.796 | 0.031 | 7.44 |
| 33592 | -53.620 | 0.101 | 9.759 | 0.062 | 8.18 |
| 33593 | -48.522 | 0.092 | 2.991 | 0.019 | 9.81 |
| 33594 | -46.471 | 0.088 | 11.506 | 0.073 | 9.20 |
| 33595 | -18.724 | 0.035 | 3.793 | 0.024 | HIGH |
| 42201 | 71.793 | 0.135 | 3.628 | 0.023 | 6.31 |
| 42202 | 3.329 | 0.006 | 1.993 | 0.013 | HIGH |
| 42203 | 36.165 | 0.068 | 1.508 | 0.010 | HIGH |
| 42204 | 46.453 | 0.088 | 2.036 | 0.013 | HIGH |
| 42205 | 25.599 | 0.048 | 12.451 | 0.080 | HIGH |
| 42206 | -25.430 | 0.048 | 14.981 | 0.096 | HIGH |
| 42207 | -27.803 | 0.052 | 5.310 | 0.034 | HIGH |
| 42208 | -63.468 | 0.120 | 16.960 | 0.108 | 6.13 |
| 42215 | 51.220 | 0.097 | 2.173 | 0.014 | 9.29 |
| 42216 | 55.380 | 0.104 | 0.734 | 0.005 | 8.56 |
| 42222 | -7.255 | 0.014 | 13.805 | 0.088 | HIGH |
| 42223 | -13.156 | 0.025 | 8.430 | 0.054 | HIGH |
| 42224 | 48.457 | 0.091 | 6.821 | 0.044 | 9.46 |

5.5.84

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42225 | 40.207 | 0.076 | 3.352 | 0.021 | HIGH |
| 42226 | 44.609 | 0.084 | 2.049 | 0.013 | HIGH |
| 42227 | 55.966 | 0.106 | 1.985 | 0.013 | 8.43 |
| 42228 | 72.794 | 0.137 | 15.999 | 0.102 | 5.42 |
| 42229 | -27.617 | 0.052 | 17.353 | 0.111 | HIGH |
| 42230 | -14.438 | 0.027 | 22.716 | 0.145 | HIGH |
| 42231 | -9.083 | 0.017 | 24.513 | 0.157 | HIGH |
| 42232 | -6.919 | 0.013 | 23.941 | 0.153 | HIGH |
| 42233 | 0.880 | 0.002 | 22.413 | 0.143 | HIGH |
| 42234 | 40.444 | 0.076 | 2.095 | 0.013 | HIGH |
| 42235 | 26.853 | 0.051 | 0.514 | 0.003 | HIGH |
| 42236 | 33.339 | 0.063 | 0.782 | 0.005 | HIGH |
| 42237 | 43.316 | 0.082 | 2.593 | 0.017 | HIGH |
| 42238 | 53.539 | 0.101 | 3.505 | 0.022 | 8.77 |
| 42239 | 34.562 | 0.065 | 33.104 | 0.211 | 6.63 |
| 42240 | -27.764 | 0.052 | 80.848 | 0.516 | 1.73 |
| 42241 | -27.529 | 0.052 | 93.094 | 0.594 | 1.20 |
| 42242 | -22.559 | 0.043 | 65.241 | 0.417 | 2.87 |
| 42243 | -11.021 | 0.021 | 14.835 | 0.095 | HIGH |
| 42244 | -2.825 | 0.005 | 22.304 | 0.142 | HIGH |
| 42245 | 25.645 | 0.048 | 2.915 | 0.019 | HIGH |
| 42246 | 15.392 | 0.029 | 4.021 | 0.026 | HIGH |
| 42247 | 21.417 | 0.040 | 1.966 | 0.013 | HIGH |
| 42248 | 32.184 | 0.061 | 0.539 | 0.003 | HIGH |
| 42249 | 54.687 | 0.103 | 4.085 | 0.026 | 8.54 |
| 42250 | 94.532 | 0.178 | 11.474 | 0.073 | 4.30 |
| 42251 | -54.199 | 0.102 | 282.033 | 1.801 | -0.66 |
| 42252 | -9.121 | 0.017 | 0.723 | 0.005 | HIGH |
| 42253 | -70.414 | 0.133 | 253.887 | 1.621 | -0.59 |
| 42254 | -34.648 | 0.065 | 18.653 | 0.119 | HIGH |
| 42255 | -15.523 | 0.029 | 17.913 | 0.114 | HIGH |
| 42256 | -4.570 | 0.009 | 17.068 | 0.109 | HIGH |
| 42257 | 4.152 | 0.008 | 0.976 | 0.006 | HIGH |
| 42258 | 6.021 | 0.011 | 1.633 | 0.010 | HIGH |
| 42259 | 16.273 | 0.031 | 1.339 | 0.009 | HIGH |
| 42260 | 3.702 | 0.007 | 0.642 | 0.004 | HIGH |
| 42261 | 15.393 | 0.029 | 0.921 | 0.006 | HIGH |
| 42262 | 30.772 | 0.058 | 22.161 | 0.142 | HIGH |
| 42263 | 117.481 | 0.222 | 23.620 | 0.151 | 2.87 |
| 42264 | -31.925 | 0.060 | 146.875 | 0.938 | 0.05 |
| 42265 | -38.579 | 0.073 | 125.188 | 0.799 | 0.34 |
| 42266 | -34.450 | 0.065 | 43.873 | 0.280 | 4.78 |
| 42267 | -24.673 | 0.047 | 10.711 | 0.068 | HIGH |
| 42268 | -17.179 | 0.032 | 10.600 | 0.068 | HIGH |
| 42269 | -13.286 | 0.025 | 8.117 | 0.052 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42270 | 28.330 | 0.053 | 0.651 | 0.004 | .HIGH |
| 42271 | 30.073 | 0.057 | 0.248 | 0.002 | HIGH |
| 42272 | 8.412 | 0.016 | 3.395 | 0.022 | HIGH |
| 42273 | 22.600 | 0.043 | 1.137 | 0.007 | HIGH |
| 42274 | 32.841 | 0.062 | 1.791 | 0.011 | HIGH |
| 42275 | 17.452 | 0.033 | 9.115 | 0.058 | HIGH |
| 42278 | 5.752 | 0.011 | 1.143 | 0.007 | HIGH |
| 42279 | 11.749 | 0.022 | 2.814 | 0.018 | HIGH |
| 42280 | 42.731 | 0.081 | 1.101 | 0.007 | HIGH |
| 42281 | 36.363 | 0.069 | 2.828 | 0.018 | HIGH |
| 42282 | 40.665 | 0.077 | 4.588 | 0.029 | HIGH |
| 42283 | 36.245 | 0.068 | 11.217 | 0.072 | HIGH |
| 42286 | 25.353 | 0.048 | 1.273 | 0.008 | HIGH |
| 42287 | 40.448 | 0.076 | 0.631 | 0.004 | HIGH |
| 42288 | 29.801 | 0.056 | 1.072 | 0.007 | HIGH |
| 42289 | 19.840 | 0.037 | 2.363 | 0.015 | HIGH |
| 42290 | 9.482 | 0.018 | 3.524 | 0.023 | HIGH |
| 42293 | 40.433 | 0.076 | 0.402 | 0.003 | HIGH |
| 42294 | 28.822 | 0.054 | 2.046 | 0.013 | HIGH |
| 42295 | 6.510 | 0.012 | 2.274 | 0.015 | HIGH |
| 42296 | -3.779 | 0.007 | 5.251 | 0.034 | HIGH |
| 42297 | -21.529 | 0.041 | 7.510 | 0.048 | HIGH |
| 42300 | 31.247 | 0.059 | 3.443 | 0.022 | HIGH |
| 42301 | 16.129 | 0.030 | 6.647 | 0.042 | HIGH |
| 42302 | -23.338 | 0.044 | 9.882 | 0.063 | HIGH |
| 42303 | -4.688 | 0.009 | 8.892 | 0.057 | HIGH |
| 42304 | -38.837 | 0.073 | 10.837 | 0.069 | HIGH |
| 42308 | 15.517 | 0.029 | 25.973 | 0.166 | HIGH |
| 42309 | 13.881 | 0.026 | 3.212 | 0.021 | HIGH |
| 42310 | -49.783 | 0.094 | 29.063 | 0.186 | 5.83 |
| 42311 | -37.877 | 0.071 | 27.295 | 0.174 | 7.44 |
| 42312 | -45.260 | 0.085 | 26.622 | 0.170 | 6.67 |
| 42316 | 3.593 | 0.007 | 15.772 | 0.101 | HIGH |
| 42317 | 7.083 | 0.013 | 175.083 | 1.118 | -0.19 |
| 42318 | -44.296 | 0.084 | 75.708 | 0.483 | 1.75 |
| 42319 | -44.586 | 0.084 | 62.028 | 0.396 | 2.55 |
| 42320 | -51.076 | 0.096 | 23.909 | 0.153 | 6.48 |
| 42323 | 32.369 | 0.061 | 156.644 | 1.000 | -0.06 |
| 42324 | 2.264 | 0.004 | 1.091 | 0.007 | HIGH |
| 42325 | -47.627 | 0.090 | 207.629 | 1.326 | -0.42 |
| 42326 | -52.359 | 0.099 | 21.980 | 0.140 | 6.63 |
| 42327 | -54.023 | 0.102 | 28.761 | 0.184 | 5.52 |
| 42329 | 4.572 | 0.009 | 115.565 | 0.738 | 0.68 |
| 42330 | -0.735 | 0.001 | 91.013 | 0.581 | 1.58 |
| 42331 | -36.117 | 0.068 | 61.915 | 0.395 | 2.77 |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42332 | -47.432 | 0.089 | 20.817 | 0.133 | 7.42 |
| 42333 | -56.343 | 0.106 | 22.591 | 0.144 | 6.14 |
| 42334 | 3.567 | 0.007 | 79.946 | 0.511 | 2.17 |
| 42335 | -7.233 | 0.014 | 34.281 | 0.219 | HIGH |
| 42336 | -26.087 | 0.049 | 29.461 | 0.188 | 8.71 |
| 42337 | -34.539 | 0.065 | 26.050 | 0.166 | 8.22 |
| 42338 | 6.915 | 0.013 | 30.194 | 0.193 | HIGH |
| 42339 | -1.469 | 0.003 | 17.293 | 0.110 | HIGH |
| 42340 | -11.445 | 0.022 | 13.935 | 0.089 | HIGH |
| 42341 | 14.876 | 0.028 | 6.962 | 0.044 | HIGH |
| 42342 | 12.333 | 0.023 | 7.239 | 0.046 | HIGH |
| 42343 | 18.409 | 0.035 | 6.737 | 0.043 | HIGH |
| 42346 | 7.171 | 0.014 | 23.909 | 0.153 | HIGH |
| 42347 | 21.126 | 0.040 | 15.571 | 0.099 | HIGH |
| 42348 | 9.829 | 0.019 | 15.813 | 0.101 | HIGH |
| 42349 | 1.255 | 0.002 | 13.839 | 0.088 | HIGH |
| 42350 | -8.715 | 0.016 | 8.196 | 0.052 | HIGH |
| 42351 | -10.289 | 0.019 | 7.942 | 0.051 | HIGH |
| 42353 | -6.921 | 0.013 | 61.358 | 0.392 | 3.83 |
| 42354 | 28.318 | 0.053 | 21.464 | 0.137 | HIGH |
| 42355 | 26.148 | 0.049 | 46.364 | 0.296 | 4.95 |
| 42356 | 14.550 | 0.027 | 46.985 | 0.300 | 5.71 |
| 42357 | -4.447 | 0.008 | 22.056 | 0.141 | HIGH |
| 42358 | -11.301 | 0.021 | 23.620 | 0.151 | HIGH |
| 42361 | 45.444 | 0.086 | 42.654 | 0.272 | 4.31 |
| 42362 | 39.096 | 0.074 | 34.907 | 0.223 | 5.85 |
| 42363 | 33.876 | 0.064 | 85.573 | 0.546 | 1.43 |
| 42364 | -1.587 | 0.003 | 56.450 | 0.360 | 4.86 |
| 42365 | -10.817 | 0.020 | 51.318 | 0.328 | 5.16 |
| 42368 | 70.842 | 0.134 | 29.792 | 0.190 | 4.31 |
| 42369 | 57.597 | 0.109 | 28.785 | 0.184 | 5.24 |
| 42370 | 57.409 | 0.108 | 79.177 | 0.506 | 1.43 |
| 42371 | -13.054 | 0.025 | 148.497 | 0.948 | 0.07 |
| 42372 | -16.064 | 0.030 | 108.360 | 0.692 | 0.80 |
| 42375 | 85.587 | 0.161 | 13.780 | 0.088 | 4.69 |
| 42376 | 28.420 | 0.054 | 20.575 | 0.131 | HIGH |
| 42377 | 40.305 | 0.076 | 76.709 | 0.490 | 1.76 |
| 42378 | -3.489 | 0.007 | 0.817 | 0.005 | HIGH |
| 42379 | -6.329 | 0.012 | 115.245 | 0.736 | 0.68 |
| 42383 | 56.168 | 0.106 | 9.052 | 0.058 | 7.87 |
| 42384 | 43.462 | 0.082 | 4.446 | 0.028 | HIGH |
| 42385 | 62.444 | 0.118 | 6.453 | 0.041 | 7 22 |
| 42386 | -13.974 | 0.026 | 41.401 | 0.264 | 7.07 |
| 42387 | -8.087 | 0.015 | 49.164 | 0.314 | 5.81 |
| 42390 | 44.659 | 0.084 | 2.453 | 0.016 | HIGH |

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S.S.87

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42391 | 32.598 | 0.062 | 3.006 | 0.019 | HIGH |
| 42392 | 22.564 | 0.043 | 3.904 | 0.025 | HIGH |
| 42393 | -16.830 | 0.032 | 6.216 | 0.040 | HIGH |
| 42394 | -0.693 | 0.001 | 12.412 | 0.079 | HIGH |
| 42396 | 9.039 | 0.017 | 3.971 | 0.025 | HIGH |
| 42397 | 13.722 | 0.026 | 0.670 | 0.004 | HIGH |
| 42398 | 3.915 | 0.007 | 1.575 | 0.010 | HIGH |
| 42399 | -18.392 | 0.035 | 2.558 | 0.016 | HIGH |
| 42400 | -34.651 | 0.065 | 7.105 | 0.045 | HIGH |
| 42401 | -10.303 | 0.019 | 2.125 | 0.014 | HIGH |
| 42402 | -1.917 | 0.004 | 1.242 | 0.008 | HIGH |
| 42403 | -8.332 | 0.016 | 0.858 | 0.005 | HIGH |
| 42404 | -19.038 | 0.036 | 0.602 | 0.004 | HIGH |
| 42405 | -31.066 | 0.059 | 0.972 | 0.006 | HIGH |
| 42406 | -14.330 | 0.027 | 6.246 | 0.040 | HIGH |
| 42407 | 1.266 | 0.002 | 2.751 | 0.018 | HIGH |
| 42408 | -15.771 | 0.030 | 0.685 | 0.004 | HIGH |
| 42409 | -36.671 | 0.069 | 0.542 | 0.003 | HIGH |
| 42410 | -31.320 | 0.059 | 3.240 | 0.021 | HIGH |
| 42411 | -6.967 | 0.013 | 4.133 | 0.026 | HIGH |
| 42412 | -14.431 | 0.027 | 1.284 | 0.008 | HIGH |
| 42413 | -34.316 | 0.065 | 1.462 | 0.009 | HIGH |
| 42414 | -33.251 | 0.063 | 1.166 | 0.007 | HIGH |
| 42415 | -31.663 | 0.060 | 0.243 | 0.002 | HIGH |
| 42455 | -95.406 | 0.180 | 37.294 | 0.238 | 2.83 |
| 42456 | -133.171 | 0.251 | 26.968 | 0.172 | 2.36 |
| 43301 | -211.617 | 0.399 | 1.922 | 0.012 | 1.50 |
| 43302 | 228.284 | 0.431 | 2.960 | 0.019 | 1.32 |
| 43303 | 288.221 | 0.544 | 3.478 | 0.022 | 0.83 |
| 43304 | -366.011 | 0.691 | 1.831 | 0.012 | 0.45 |
| 43305 | 218.534 | 0.412 | 1.891 | 0.012 | 1.42 |
| 43306 | -232.353 | 0.438 | 6.645 | 0.042 | 1.26 |
| 43307 | 90.659 | 0.171 | 2.346 | 0.015 | 4.82 |
| 43308 | -124.197 | 0.234 | 5.062 | 0.032 | 3.22 |
| 43313 | -183.447 | 0.346 | 2.914 | 0.019 | 1.88 |
| 43314 | -257.591 | 0.486 | 2.102 | 0.013 | 1.06 |
| 43319 | 129.143 | 0.244 | 0.327 | 0.002 | 3.10 |
| 43320 | 73.495 | 0.139 | 5.047 | 0.032 | 6.09 |
| 43321 | -230.592 | 0.435 | 4.915 | 0.031 | 1.29 |
| 43322 | -237.989 | 0.449 | 1.866 | 0.012 | 1.22 |
| 43323 | -172.173 | 0.325 | 2.426 | 0.015 | 2.07 |
| 43324 | -150.641 | 0.284 | 6.132 | 0.039 | 2.48 |
| 43327 | 76.052 | 0.143 | 24.021 | 0.153 | 4.52 |
| 43328 | 97.047 | 0.183 | 1.084 | 0.007 | 4.46 |
| 43329 | 110.306 | 0.208 | 2.806 | 0.018 | 3.78 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43330 | 79.919 | 0.151 | 8.654 | 0.055 | 5.37 |
| 43331 | -197.629 | 0.373 | 4.781 | 0.031 | 1.67 |
| 43332 | -159.926 | 0.302 | 3.299 | 0.021 | 2.30 |
| 43333 | -120.647 | 0.228 | 1.061 | 0.007 | 3.39 |
| 43334 | -17.268 | 0.033 | 7.127 | 0.046 | HIGH |
| 43338 | -18.585 | 0.035 | 15.124 | 0.097 | HIGH |
| 43339 | 42.967 | 0.081 | 2.698 | 0.017 | HIGH |
| 43340 | 47.018 | 0.089 | 5.350 | 0.034 | 9.94 |
| 43341 | 63.622 | 0.120 | 8.358 | 0.053 | 6.94 |
| 43342 | -177.085 | 0.334 | 3.556 | 0.023 | 1.98 |
| 43343 | -138.799 | 0.262 | 4.196 | 0.027 | 2.79 |
| 43344 | -144.219 | 0.272 | 3.473 | 0.022 | 2.66 |
| 43345 | -141.067 | 0.266 | 3.576 | 0.023 | 2.74 |
| 43346 | 165.370 | 0.312 | 15.760 | 0.101 | 2.03 |
| 43349 | -154.269 | 0.291 | 6.595 | 0.042 | 2.39 |
| 43350 | 71.764 | 0.135 | 4.593 | 0.029 | 6.27 |
| 43351 | 55.508 | 0.105 | 3.926 | 0.025 | 8.41 |
| 43352 | 32.078 | 0.061 | 5.963 | 0.038 | HIGH |
| 43353 | 42.310 | 0.080 | 5.287 | 0.034 | HIGH |
| 43354 | -169.766 | 0.320 | 3.443 | 0.022 | 2.11 |
| 43355 | -124.229 | 0.234 | 3.392 | 0.022 | 3.24 |
| 43356 | -123.685 | 0.233 | 3.521 | 0.022 | 3.26 |
| 43357 | -116.386 | 0.220 | 3.519 | 0.022 | 3.53 |
| 43358 | -74.719 | 0.141 | 4.892 | 0.031 | 5.98 |
| 43359 | -80.229 | 0.151 | 9.789 | 0.063 | 5.28 |
| 43360 | -2.344 | 0.004 | 11.660 | 0.074 | HIGH |
| 43361 | 80.641 | 0.152 | 5.410 | 0.035 | 5.45 |
| 43362 | 34.671 | 0.065 | 3.233 | 0.021 | HIGH |
| 43363 | 54.652 | 0.103 | 2.525 | 0.016 | 8.63 |
| 43364 | 37.120 | 0.070 | 3.592 | 0.023 | HIGH |
| 43365 | 9.501 | 0.018 | 4.740 | 0.030 | HIGH |
| 43366 | -4.451 | 0.008 | 4.002 | 0.026 | HIGH |
| 43367 | -155.960 | 0.294 | 11.665 | 0.074 | 2.28 |
| 43368 | -119.634 | 0.226 | 2.204 | 0.014 | 3.42 |
| 43369 | -99.974 | 0.189 | 2.414 | 0.015 | 4.28 |
| 43370 | -81.054 | 0.153 | 2.473 | 0.016 | 5.51 |
| 43371 | -51.035 | 0.096 | 2.029 | 0.013 | 9.33 |
| 43372 | -42.963 | 0.081 | 4.605 | 0.029 | HIGH |
| 43373 | -19.091 | 0.036 | 6.392 | 0.041 | HIGH |
| 43374 | 27.428 | 0.052 | 6.305 | 0.040 | HIGH |
| 43375 | 34.405 | 0.065 | 2.483 | 0.016 | HIGH |
| 43376 | 30.355 | 0.057 | 1.047 | 0.007 | HIGH |
| 43377 | 35.655 | 0.067 | 1.511 | 0.010 | HIGH |
| 43378 | 20.582 | 0.039 | 1.730 | 0.011 | HIGH |
| 43379 | -6.082 | 0.011 | 4.210 | 0.027 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43380 | -52.539 | 0.099 | 10.183 | 0.065 | 8.30 |
| 43382 | -83.452 | 0.157 | 3.512 | 0.022 | 5.30 |
| 43383 | -60.046 | 0.113 | 1.704 | 0.011 | 7.80 |
| 43384 | -41.706 | 0.079 | 0.992 | 0.006 | HIGH |
| 43385 | -23.122 | 0.044 | 1.230 | 0.008 | HIGH |
| 43386 | -13.623 | 0.026 | 1.036 | 0.007 | HIGH |
| 43387 | -4.937 | 0.009 | 1.866 | 0.012 | HIGH |
| 43388 | 10.381 | 0.020 | 1.807 | 0.012 | HIGH |
| 43389 | 22.749 | 0.043 | 1.623 | 0.010 | HIGH |
| 43390 | 26.841 | 0.051 | 0.844 | 0.005 | HIGH |
| 43391 | 28.616 | 0.054 | 0.587 | 0.004 | HIGH |
| 43392 | 30.337 | 0.057 | 0.353 | 0.002 | HIGH |
| 43393 | 18.987 | 0.036 | 1.349 | 0.009 | HIGH |
| 43394 | 9.833 | 0.019 | 9.117 | 0.058 | HIGH |
| 43397 | -129.475 | 0.244 | 5.721 | 0.037 | 3.04 |
| 43398 | -128.373 | 0.242 | 2.634 | 0.017 | 3.12 |
| 43399 | -117.005 | 0.221 | 0.491 | 0.003 | 3.53 |
| 43400 | -94.602 | 0.178 | 1.697 | 0.011 | 4.59 |
| 43401 | -66.688 | 0.126 | 1.725 | 0.011 | 6.92 |
| 43402 | 9.838 | 0.019 | 1.321 | 0.008 | HIGH |
| 43403 | 215.497 | 0.407 | 2.598 | 0.017 | 1.45 |
| 43406 | -83.051 | 0.157 | 1.875 | 0.012 | 5.36 |
| 43407 | -119.278 | 0.225 | 2.439 | 0.016 | 3.43 |
| 43408 | -138.878 | 0.262 | 2.399 | 0.015 | 2.81 |
| 43409 | -139.457 | 0.263 | 2.776 | 0.018 | 2.79 |
| 43410 | -134.109 | 0.253 | 4.796 | 0.031 | 2.92 |
| 43411 | -173.239 | 0.327 | 4.818 | 0.031 | 2.04 |
| 43412 | -197.854 | 0.373 | 2.512 | 0.016 | 1.67 |
| 43413 | 29.175 | 0.055 | 8.118 | 0.052 | HIGH |
| 43415 | -117.391 | 0.221 | 4.830 | 0.031 | 3.47 |
| 43416 | -153.518 | 0.290 | 4.612 | 0.029 | 2.43 |
| 43417 | -172.393 | 0.325 | 3.521 | 0.022 | 2.06 |
| 43418 | -179.708 | 0.339 | 7.635 | 0.049 | 1.91 |
| 43419 | -182.908 | 0.345 | 8.312 | 0.053 | 1.85 |
| 43420 | -288.451 | 0.544 | 8.959 | 0.057 | 0.82 |
| 43421 | -317.198 | 0.598 | 9.524 | 0.061 | 0.65 |
| 43424 | -157.088 | 0.296 | 8.369 | 0.053 | 2.31 |
| 43425 | -197.192 | 0.372 | 8.108 | 0.052 | 1.65 |
| 43426 | -227.116 | 0.429 | 4.656 | 0.030 | 1.32 |
| 43427 | -268.653 | 0.507 | 16.760 | 0.107 | 0.90 |
| 43428 | -474.285 | 0.895 | 18.500 | 0.118 | 0.09 |
| 43430 | -240.424 | 0.454 | 12.766 | 0.082 | 1.15 |
| 43432 | -186.982 | 0.353 | 12.548 | 0.080 | 1.74 |
| 43433 | -220.825 | 0.417 | 11.291 | 0.072 | 1.34 |
| 43434 | -228.896 | 0.432 | 10.063 | 0.064 | 1.27 |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43435 | -198.005 | 0.374 | 54.511 | 0.348 | 0.88 |
| 43438 | -521.147 | 0.983 | 48.406 | 0.309 | -0.10 |
| 43440 | -204.050 | 0.385 | 18.855 | 0.120 | 1.44 |
| 43441 | -238.579 | 0.450 | 12.560 | 0.080 | 1.16 |
| 43442 | -262.380 | 0.495 | 16.469 | 0.105 | 0.94 |
| 43443 | -288.878 | 0.545 | 38.817 | 0.248 | 0.58 |
| 43446 | -342.621 | 0.646 | 39.435 | 0.252 | 0.36 |
| 43450 | -210.156 | 0.397 | 22.798 | 0.146 | 1.32 |
| 43451 | -251.370 | 0.474 | 10.516 | 0.067 | 1.07 |
| 43452 | -297.675 | 0.562 | 21.428 | 0.137 | 0.69 |
| 43453 | -190.809 | 0.360 | 33.035 | 0.211 | 1.35 |
| 43455 | -402.151 | 0.759 | 10.577 | 0.068 | 0.30 |
| 43456 | -399.179 | 0.753 | 13.299 | 0.085 | 0.30 |
| 43457 | -174.662 | 0.330 | 17.928 | 0.114 | 1.84 |
| 43459 | -203.984 | 0.385 | 22.562 | 0.144 | 1.39 |
| 43460 | -241.119 | 0.455 | 7.760 | 0.050 | 1.17 |
| 43461 | -251.961 | 0.475 | 13.638 | 0.087 | 1.04 |
| 43462 | -171.042 | 0.323 | 16.868 | 0.108 | 1.92 |
| 43463 | -266.497 | 0.503 | 7.680 | 0.049 | 0.97 |
| 43464 | -329.701 | 0.622 | 6.849 | 0.044 | 0.60 |
| 43465 | -327.780 | 0.618 | 7.241 | 0.046 | 0.60 |
| 43467 | -190.793 | 0.360 | 17.922 | 0.114 | 1.61 |
| 43468 | -217.551 | 0.410 | 7.321 | 0.047 | 1.41 |
| 43469 | -208.443 | 0.393 | 9.327 | 0.060 | 1.50 |
| 43470 | -228.335 | 0.431 | 8.642 | 0.055 | 1.29 |
| 43471 | -212.189 | 0.400 | 4.984 | 0.032 | 1.48 |
| 43472 | -216.230 | 0.408 | 5.671 | 0.036 | 1.43 |
| 43473 | -165.822 | 0.313 | 6.595 | 0.042 | 2.16 |
| 43474 | -172.195 | 0.325 | 11.733 | 0.075 | 1.98 |
| 43475 | -194.395 | 0.367 | 5.922 | 0.038 | 1.70 |
| 43476 | -199.684 | 0.377 | 5.896 | 0.038 | 1.63 |
| 43477 | -182.255 | 0.344 | 5.482 | 0.035 | 1.88 |
| 43478 | -158.960 | 0.300 | 3.391 | 0.022 | 2.32 |
| 43479 | -152.259 | 0.287 | 10.268 | 0.066 | 2.38 |
| 43480 | -155.499 | 0.293 | 6.190 | 0.040 | 2.37 |
| 43481 | -175.936 | 0.332 | 3.766 | 0.024 | 2.00 |
| 43482 | -160.940 | 0.304 | 3.650 | 0.023 | 2.28 |
| 43483 | -133.465 | 0.252 | 2.192 | 0.014 | 2.96 |
| 43484 | -125.051 | 0.236 | 10.649 | 0.068 | 3.08 |
| 43485 | -139.957 | 0.264 | 2.326 | 0.015 | 2.78 |
| 43486 | -146.226 | 0.276 | 2.328 | 0.015 | 2.62 |
| 43487 | -119.688 | 0.226 | 0.414 | 0.003 | 3.43 |
| 43488 | -94.721 | 0.179 | 7.460 | 0.048 | 4.45 |
| 43489 | -120.232 | 0.227 | 3.645 | 0.023 | 3.38 |
| 43490 | -126.892 | 0.239 | 5.868 | 0.037 | 3.12 |

16.5.5.91

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43491 | -76.270 | 0.144 | 2.333 | 0.015 | 5.92 |
| 43492 | -185.166 | 0.349 | 18.749 | 0.120 | 1.68 |
| 43499 | -247.897 | 0.468 | 5.757 | 0.037 | 1.12 |
| 43500 | -72.805 | 0.137 | 1.643 | 0.010 | 6.26 |
| 43501 | 1.384 | 0.003 | 2.048 | 0.013 | HIGH |
| 43502 | 28.751 | 0.054 | 1.114 | 0.007 | HIGH |
| 43503 | 55.654 | 0.105 | 0.374 | 0.002 | 8.52 |
| 43504 | 101.054 | 0.191 | 1.714 | 0.011 | 4.23 |
| 43505 | 176.158 | 0.332 | 14.551 | 0.093 | 1.87 |
| 43509 | 44.053 | 0.083 | 4.529 | 0.029 | HIGH |
| 43510 | 57.760 | 0.109 | 4.544 | 0.029 | 8.01 |
| 43511 | 53.761 | 0.101 | 4.158 | 0.027 | 8.69 |
| 43512 | 77.104 | 0.145 | 1.500 | 0.010 | 5.86 |
| 43513 | 104.620 | 0.197 | 1.844 | 0.012 | 4.06 |
| 43514 | 131.184 | 0.248 | 3.892 | 0.025 | 3.01 |
| 43515 | 124.758 | 0.235 | 8.080 | 0.052 | 3.15 |
| 43518 | 172.136 | 0.325 | 16.498 | 0.105 | 1.90 |
| 43519 | 152.061 | 0.287 | 8.283 | 0.053 | 2.42 |
| 43520 | 93.834 | 0.177 | 7.770 | 0.050 | 4.49 |
| 43521 | 110.034 | 0.208 | 4.975 | 0.032 | 3.76 |
| 43522 | 127.512 | 0.241 | 3.338 | 0.021 | 3.14 |
| 43523 | 142.548 | 0.269 | 4.200 | 0.027 | 2.69 |
| 43524 | 136.138 | 0.257 | 4.285 | 0.027 | 2.87 |
| 43526 | 138.173 | 0.261 | 38.819 | 0.248 | 1.88 |
| 43528 | 340.126 | 0.642 | 13.293 | 0.085 | 0.53 |
| 43529 | 188.269 | 0.355 | 11.319 | 0.072 | 1.74 |
| 43530 | 168.394 | 0.318 | 4.051 | 0.026 | 2.13 |
| 43531 | 163.148 | 0.308 | 6.403 | 0.041 | 2.21 |
| 43532 | 142.126 | 0.268 | 6.550 | 0.042 | 2.68 |
| 43534 | 380.884 | 0.719 | 43.249 | 0.276 | 0.21 |
| 43537 | 101.722 | 0.192 | 38.311 | 0.245 | 2.61 |
| 43538 | 170.386 | 0.321 | 7.438 | 0.047 | 2.06 |
| 43539 | 176.908 | 0.334 | 9.078 | 0.058 | 1.94 |
| 43540 | 153.904 | 0.290 | 9.291 | 0.059 | 2.36 |
| 43544 | 285.391 | 0.538 | 14.541 | 0.093 | 0.80 |
| 43547 | 244.476 | 0.461 | 39.045 | 0.249 | 0.82 |
| 43548 | 212.961 | 0.402 | 12.847 | 0.082 | 1.41 |
| 43549 | 198.299 | 0.374 | 11.180 | 0.071 | 1.60 |
| 43550 | 170.712 | 0.322 | 13.776 | 0.088 | 1.97 |
| 43553 | 410.019 | 0.774 | 7.812 | 0.050 | 0.28 |
| 43554 | 430.617 | 0.812 | 7.147 | 0.046 | 0.22 |
| 43556 | 130.846 | 0.247 | 33.519 | 0.214 | 2.18 |
| 43557 | 272.921 | 0.515 | 20.166 | 0.129 | 0.84 |
| 43558 | 226.692 | 0.428 | 11.294 | 0.072 | 1.28 |
| 43559 | 188.979 | 0.357 | 19.074 | 0.122 | 1.62 |

5.5.92

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43561 | 438.486 | 0.827 | 6.379 | 0.041 | 0.20 |
| 43562 | 404.006 | 0.762 | 6.405 | 0.041 | 0.31 |
| 43563 | 303.036 | 0.572 | 5.797 | 0.037 | 0.74 |
| 43564 | 188.135 | 0.355 | 23.497 | 0.150 | 1.56 |
| 43565 | 265.069 | 0.500 | 17.130 | 0.109 | 0.92 |
| 43566 | 241.426 | 0.456 | 8.162 | 0.052 | 1.17 |
| 43567 | 199.743 | 0.377 | 21.998 | 0.140 | 1.44 |
| 43568 | 270.859 | 0.511 | 5.070 | 0.032 | 0.95 |
| 43569 | 327.670 | 0.618 | 4.622 | 0.030 | 0.61 |
| 43570 | 288.647 | 0.545 | 2.922 | 0.019 | 0.83 |
| 43571 | 285.546 | 0.539 | 9.711 | 0.062 | 0.83 |
| 43572 | 244.148 | 0.461 | 10.769 | 0.069 | 1.13 |
| 43573 | 236.200 | 0.446 | 7.239 | 0.046 | 1.22 |
| 43574 | 201.586 | 0.380 | 20.462 | 0.131 | 1.45 |
| 43575 | 248.861 | 0.470 | 7.155 | 0.046 | 1.11 |
| 43576 | 257.154 | 0.485 | 2.598 | 0.017 | 1.06 |
| 43577 | 262.595 | 0.495 | 5.194 | 0.033 | 1.01 |
| 43578 | 255.384 | 0.482 | 5.532 | 0.035 | 1.06 |
| 43579 | 225.570 | 0.426 | 5.563 | 0.036 | 1.33 |
| 43580 | 192.061 | 0.362 | 16.154 | 0.103 | 1.62 |
| 43581 | 227.788 | 0.430 | 6.303 | 0.040 | 1.31 |
| 43582 | 232.445 | 0.439 | 2.314 | 0.015 | 1.28 |
| 43583 | 231.967 | 0.438 | 3.120 | 0.020 | 1.28 |
| 43584 | 213.206 | 0.402 | 3.188 | 0.020 | 1.48 |
| 43585 | 174.005 | 0.328 | 11.254 | 0.072 | 1.96 |
| 43586 | 208.531 | 0.393 | 3.445 | 0.022 | 1.53 |
| 43587 | 203.652 | 0.384 | 1.565 | 0.010 | 1.60 |
| 43588 | 184.163 | 0.347 | 1.617 | 0.010 | 1.88 |
| 43589 | 149.667 | 0.282 | 6.566 | 0.042 | 2.49 |
| 43590 | 147.761 | 0.279 | 2.607 | 0.017 | 2.58 |
| 43591 | 143.917 | 0.272 | 1.195 | 0.008 | 2.68 |
| 43592 | 109.041 | 0.206 | 4.374 | 0.028 | 3.82 |
| 43594 | 75.368 | 0.142 | 9.804 | 0.063 | 5.66 |
| 52201 | -201.306 | 0.380 | 8.031 | 0.051 | 1.60 |
| 52202 | 100.894 | 0.190 | 2.648 | 0.017 | 4.23 |
| 52204 | -238.005 | 0.449 | 2.893 | 0.018 | 1.22 |
| 52205 | -129.014 | 0.243 | 8.413 | 0.054 | 3.01 |
| 52206 | 108.993 | 0.206 | 8.128 | 0.052 | 3.73 |
| 52207 | -151.773 | 0.286 | 20.307 | 0.130 | 2.18 |
| 52208 | 88.367 | 0.167 | 13.100 | 0.084 | 4.56 |
| 52215 | -209.984 | 0.396 | 19.189 | 0.123 | 1.37 |
| 52216 | -157.670 | 0.297 | 10.018 | 0.064 | 2.27 |
| 52222 | -227.716 | 0.430 | 16.260 | 0.104 | 1.23 |
| 52223 | -208.378 | 0.393 | 18.930 | 0.121 | 1.39 |
| 52224 | -182.570 | 0.344 | 23.798 | 0.152 | 1.62 |

5.5.93

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52225 | -173.826 | 0.328 | 11.175 | 0.071 | 1.96 |
| 52226 | -171.654 | 0.324 | 2.214 | 0.014 | 2.08 |
| 52227 | -214.982 | 0.406 | 16.517 | 0.105 | 1.35 |
| 52228 | -143.991 | 0.272 | 11.110 | 0.071 | 2.55 |
| 52229 | -124.023 | 0.234 | 2.082 | 0.013 | 3.26 |
| 52230 | -6.796 | 0.013 | 19.016 | 0.121 | HIGH |
| 52231 | -223.560 | 0.422 | 13.074 | 0.083 | 1.30 |
| 52232 | -63.993 | 0.121 | 6.864 | 0.044 | 7.00 |
| 52233 | -112.213 | 0.212 | 105.161 | 0.672 | 0.41 |
| 52234 | -156.919 | 0.296 | 13.676 | 0.087 | 2.22 |
| 52235 | -148.336 | 0.280 | 9.635 | 0.062 | 2.48 |
| 52236 | -131.391 | 0.248 | 0.805 | 0.005 | 3.03 |
| 52237 | -116.622 | 0.220 | 1.514 | 0.010 | 3.54 |
| 52238 | -102.005 | 0.192 | 19.126 | 0.122 | 3.59 |
| 52239 | -30.676 | 0.058 | 13.491 | 0.086 | HIGH |
| 52240 | 79.256 | 0.150 | 52.901 | 0.338 | 2.34 |
| 52241 | -194.451 | 0.367 | 88.528 | 0.565 | 0.36 |
| 52242 | -241.524 | 0.456 | 181.982 | 1.162 | -0.43 |
| 52243 | -35.786 | 0.068 | 0.440 | 0.003 | HIGH |
| 52244 | -126.681 | 0.239 | 282.002 | 1.801 | -0.67 |
| 52245 | -113.756 | 0.215 | 6.603 | 0.042 | 3.58 |
| 52246 | -102.388 | 0.193 | 5.812 | 0.037 | 4.09 |
| 52247 | -114.053 | 0.215 | 1.476 | 0.009 | 3.64 |
| 52248 | -87.026 | 0.164 | 1.269 | 0.008 | 5.08 |
| 52249 | -37.697 | 0.071 | 11.565 | 0.074 | HIGH |
| 52250 | -51.256 | 0.097 | 13.475 | 0.086 | 8.06 |
| 52251 | -4.375 | 0.008 | 20.856 | 0.133 | HIGH |
| 52252 | -65.719 | 0.124 | 48.783 | 0.312 | 2.94 |
| 52253 | -42.325 | 0.080 | 32.389 | 0.207 | 5.98 |
| 52254 | -63.587 | 0.120 | 75.954 | 0.485 | 1.49 |
| 52255 | -173.509 | 0.327 | 87.803 | 0.561 | 0.45 |
| 52256 | -174.035 | 0.328 | 28.153 | 0.180 | 1.65 |
| 52257 | -69.208 | 0.131 | 5.942 | 0.038 | 6.47 |
| 52258 | -79.135 | 0.149 | 3.661 | 0.023 | 5.64 |
| 52259 | -47.181 | 0.089 | 4.023 | 0.026 | HIGH |
| 52260 | -68.140 | 0.129 | 2.639 | 0.017 | 6.73 |
| 52261 | -82.541 | 0.156 | 10.976 | 0.070 | 5.05 |
| 52262 | 2.244 | 0.004 | 6.612 | 0.042 | HIGH |
| 52263 | -6.527 | 0.012 | 5.452 | 0.035 | HIGH |
| 52264 | -28.464 | 0.054 | 19.793 | 0.126 | HIGH |
| 52265 | -26.969 | 0.051 | 20.395 | 0.130 | HIGH |
| 52266 | -40.855 | 0.077 | 25.300 | 0.162 | 7.46 |
| 52267 | -99.080 | 0.187 | 39.282 | 0.251 | 2.63 |
| 52268 | -111.279 | 0.210 | 22.376 | 0.143 | 3.11 |
| 52269 | -142.787 | 0.269 | 7.178 | 0.046 | 2.65 |

S.S.94

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52270 | -33.323 | 0.063 | 2.098 | 0.013 | HIGH |
| 52271 | -32.295 | 0.061 | 0.250 | 0.002 | HIGH |
| 52272 | -45.697 | 0.086 | 1.770 | 0.011 | HIGH |
| 52273 | -60.720 | 0.115 | 1.557 | 0.010 | 7.70 |
| 52274 | -63.846 | 0.120 | 0.900 | 0.006 | 7.29 |
| 52275 | 119.603 | 0.226 | 2.976 | 0.019 | 3.41 |
| 52278 | -22.996 | 0.043 | 5.863 | 0.037 | HIGH |
| 52279 | -87.945 | 0.166 | 0.298 | 0.002 | 5.03 |
| 52280 | 0.367 | 0.001 | 0.229 | 0.001 | HIGH |
| 52281 | -142.767 | 0.269 | 1.049 | 0.007 | 2.71 |
| 52282 | -148.742 | 0.281 | 2.404 | 0.015 | 2.55 |
| 52283 | -126.263 | 0.238 | 4.709 | 0.030 | 3.16 |
| 52286 | -106.559 | 0.201 | 6.912 | 0.044 | 3.87 |
| 52287 | -101.043 | 0.191 | 0.718 | 0.005 | 4.24 |
| 52288 | -106.574 | 0.201 | 0.588 | 0.004 | 3.97 |
| 52289 | -127.847 | 0.241 | 0.831 | 0.005 | 3.14 |
| 52290 | -169.305 | 0.319 | 0.629 | 0.004 | 2.13 |
| 52293 | -78.551 | 0.148 | 13.881 | 0.089 | 5.15 |
| 52294 | -108.110 | 0.204 | 0.991 | 0.006 | 3.90 |
| 52295 | -11.863 | 0.022 | 0.301 | 0.002 | HIGH |
| 52296 | -156.386 | 0.295 | 5.021 | 0.032 | 2.36 |
| 52297 | -249.086 | 0.470 | 6.132 | 0.039 | 1.11 |
| 52300 | -42.560 | 0.080 | 11.762 | 0.075 | 9.98 |
| 52301 | -92.818 | 0.175 | 5.052 | 0.032 | 4.63 |
| 52302 | -111.292 | 0.210 | 6.782 | 0.043 | 3.67 |
| 52303 | -181.584 | 0.343 | 14.236 | 0.091 | 1.80 |
| 52304 | -202.937 | 0.383 | 19.488 | 0.124 | 1.45 |
| 52308 | -63.901 | 0.121 | 16.301 | 0.104 | 6.16 |
| 52309 | -57.656 | 0.109 | 16.835 | 0.108 | 6.75 |
| 52310 | -104.102 | 0.196 | 28.898 | 0.185 | 3.03 |
| 52311 | -213.297 | 0.402 | 36.630 | 0.234 | 1.08 |
| 52312 | -384.763 | 0.726 | 23.189 | 0.148 | 0.31 |
| 52316 | -9.383 | 0.018 | 30.971 | 0.198 | HIGH |
| 52317 | 12.547 | 0.024 | 22.724 | 0.145 | HIGH |
| 52318 | 74.393 | 0.140 | 119.176 | 0.761 | 0.32 |
| 52319 | -325.900 | 0.615 | 1.501 | 0.010 | 0.63 |
| 52320 | -123.080 | 0.232 | 18.799 | 0.120 | 2.90 |
| 52323 | 23.323 | 0.044 | 46.477 | 0.297 | 5.12 |
| 52324 | 20.409 | 0.039 | 25.183 | 0.161 | HIGH |
| 52325 | -3.552 | 0.007 | 41.478 | 0.265 | 8.57 |
| 52326 | 44.114 | 0.083 | 120.402 | 0.769 | 0.40 |
| 52327 | 198.721 | 0.375 | 10.002 | 0.064 | 1.61 |
| 52329 | 67.318 | 0.127 | 26.380 | 0.168 | 4.84 |
| 52330 | 80.633 | 0.152 | 12.526 | 0.080 | 5.09 |
| 52331 | 101.831 | 0.192 | 96.886 | 0.619 | 0.60 |

S.S.S.

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52332 | 139.916 | 0.264 | 148.588 | 0.949 | -0.15 |
| 52333 | 171.803 | 0.324 | 66.564 | 0.425 | 0.83 |
| 52334 | 116.381 | 0.220 | 15.399 | 0.098 | 3.22 |
| 52335 | 176.224 | 0.332 | 121.763 | 0.778 | 0 02 |
| 52336 | 24.910 | 0.047 | 0.791 | 0.005 | HIGH |
| 52337 | 228.763 | 0.432 | 304.771 | 1.946 | -0.73 |
| 52338 | 106.538 | 0.201 | 33.224 | 0.212 | 2.74 |
| 52339 | 117.470 | 0.222 | 79.637 | 0.509 | 0.89 |
| 52340 | 169.843 | 0.320 | 35.921 | 0.229 | 1.52 |
| 52341 | 78.349 | 0.148 | 14.660 | 0.094 | 5.11 |
| 52342 | 115.843 | 0.219 | 12.656 | 0.081 | 3.33 |
| 52343 | 48.590 | 0.092 | 20.569 | 0.131 | 7.31 |
| 52346 | 60.419 | 0.114 | 6.079 | 0.039 | 7.52 |
| 52347 | -106.623 | 0.201 | 6.754 | 0.043 | 3.87 |
| 52348 | -31.266 | 0.059 | 52.360 | 0.334 | 3.85 |
| 52349 | -59.264 | 0.112 | 120.883 | 0.772 | 0.34 |
| 52350 | -52.617 | 0.099 | 7.326 | 0.047 | 8.62 |
| 52351 | -15.300 | 0.029 | 11.425 | 0.073 | HIGH |
| 52353 | -562.159 | 1.061 | 11.386 | 0.073 | -0.07 |
| 52354 | -526.451 | 0.993 | 13.055 | 0.083 | -0.01 |
| 52355 | -210.032 | 0.396 | 218.289 | 1.394 | -0.54 |
| 52356 | -19.740 | 0.037 | 0.226 | 0.001 | HIGH |
| 52357 | -72.966 | 0.138 | 71.992 | 0.460 | 1.54 |
| 52358 | -57.416 | 0.108 | 7.528 | 0.048 | 7.83 |
| 52361 | -435.783 | 0.822 | 22.826 | 0.146 | 0.17 |
| 52362 | -225.526 | 0.426 | 78.214 | 0.499 | 0.38 |
| 52363 | -177.841 | 0.336 | 41.293 | 0.264 | 1.31 |
| 52364 | -155.428 | 0.293 | 35.364 | 0.226 | 1.72 |
| 52365 | -92.575 | 0.175 | 24.730 | 0.158 | 3.67 |
| 52368 | -43.671 | 0.082 | 27.621 | 0.176 | 6.67 |
| 52369 | -177.906 | 0.336 | 10.416 | 0.067 | 1.90 |
| 52370 | -101.438 | 0.191 | 163.369 | 1.043 | -0.21 |
| 52371 | -124.527 | 0.235 | 41.175 | 0.263 | 2.02 |
| 52372 | -107.621 | 0.203 | 41.981 | 0.268 | 2.30 |
| 52375 | -5.119 | 0.010 | 32.873 | 0.210 | HIGH |
| 52376 | -22.398 | 0.042 | 14.810 | 0.095 | HIGH |
| 52377 | -131.821 | 0.249 | 53.806 | 0.344 | 1.48 |
| 52378 | -71.153 | 0.134 | 36.214 | 0.231 | 3.73 |
| 52379 | -70.779 | 0.134 | 39.524 | 0.252 | 3.48 |
| 52383 | 141.823 | 0.268 | 14.143 | 0.090 | 2.54 |
| 52384 | 65.456 | 0.124 | 12.677 | 0.081 | 6.36 |
| 52385 | -6.793 | 0.013 | 22.414 | 0.143 | HIGH |
| 52386 | -53.667 | 0.101 | 24.692 | 0.158 | 6.11 |
| 52387 | -29.842 | 0.056 | 43.827 | 0.280 | 5.10 |
| 52390 | 74.561 | 0.141 | 1.303 | 0.008 | 6.10 |

5.5.96

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52391 | 66.348 | 0.125 | 1.088 | 0.007 | 6.98 |
| 52392 | 94.446 | 0.178 | 12.260 | 0.078 | 4.27 |
| 52393 | -10.366 | 0.020 | 9.248 | 0.059 | HIGH |
| 52394 | 2.533 | 0.005 | 25.460 | 0.163 | HIGH |
| 52396 | 179.200 | 0.338 | 4.249 | 0.027 | 1.94 |
| 52397 | 129.906 | 0.245 | 1.141 | 0.007 | 3.08 |
| 52398 | 111.368 | 0.210 | 0.949 | 0.006 | 3.76 |
| 52399 | 12.250 | 0.023 | 4.625 | 0.030 | HIGH |
| 52400 | 73.807 | 0.139 | 14.708 | 0.094 | 5.44 |
| 52401 | 184.525 | 0.348 | 8.958 | 0.057 | 1.82 |
| 52402 | 169.210 | 0.319 | 5.853 | 0.037 | 2.10 |
| 52403 | 154.554 | 0.292 | 1.058 | 0.007 | 2.43 |
| 52404 | 150.461 | 0.284 | 0.974 | 0.006 | 2.52 |
| 52405 | 36.017 | 0.068 | 40.501 | 0.259 | 5.18 |
| 52406 | 165.225 | 0.312 | 18.233 | 0.116 | 1.99 |
| 52407 | 136.818 | 0.258 | 5.574 | 0.036 | 2.83 |
| 52408 | 162.233 | 0.306 | 2.324 | 0.015 | 2.26 |
| 52409 | 166.460 | 0.314 | 10.122 | 0.065 | 2.10 |
| 52410 | 154.610 | 0.292 | 15.747 | 0.101 | 2.23 |
| 52411 | 140.631 | 0.265 | 1.529 | 0.010 | 2.76 |
| 52412 | 112.069 | 0.211 | 2.413 | 0.015 | 3.71 |
| 52413 | 136.777 | 0.258 | 4.529 | 0.029 | 2.84 |
| 52414 | 140.311 | 0.265 | 3.633 | 0.023 | 2.76 |
| 52415 | 87.717 | 0.166 | 5.396 | 0.034 | 4.94 |
| 52425 | -269.609 | 0.509 | 7.558 | 0.048 | 0.95 |
| 52426 | 144.601 | 0.273 | 1.311 | 0.008 | 2.66 |
| 52427 | -180.219 | 0.340 | 1.973 | 0.013 | 1.94 |
| 52443 | -149.550 | 0.282 | 2.987 | 0.019 | 2.53 |
| 52444 | -63.666 | 0.120 | 3.469 | 0.022 | 7.24 |
| 52445 | 147.014 | 0.277 | 3.911 | 0.025 | 2.58 |
| 52446 | -58.844 | 0.111 | 6.956 | 0.044 | 7.67 |
| 52447 | 70.423 | 0.133 | 24.507 | 0.156 | 4.82 |
| 52463 | -139.419 | 0.263 | 3.962 | 0.025 | 2.78 |
| 52464 | -193.125 | 0.364 | 3.192 | 0.020 | 1.74 |
| 52465 | 50.569 | 0.095 | 8.924 | 0.057 | 8.80 |
| 53301 | 164.837 | 0.311 | 2.514 | 0.016 | 2.21 |
| 53302 | -194.241 | 0.366 | 7.456 | 0.048 | 1.69 |
| 53303 | -197.733 | 0.373 | 11.533 | 0.074 | 1.61 |
| 53304 | 249.429 | 0.471 | 6.327 | 0.040 | 1.11 |
| 53305 | 339.622 | 0.641 | 4.653 | 0.030 | 0.56 |
| 53306 | -38.176 | 0.072 | 9.715 | 0.062 | HIGH |
| 53307 | 430.809 | 0.813 | 7.034 | 0.045 | 0.22 |
| 53308 | -104.792 | 0.198 | 9.360 | 0.060 | 3.88 |
| 53313 | 186.655 | 0.352 | 3.679 | 0.023 | 1.83 |
| 53314 | 229.221 | 0.432 | 4.944 | 0.032 | 1.30 |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53319 | 385.592 | 0.728 | 5.437 | 0.035 | 0.37 |
| 53320 | 332.803 | 0.628 | 8.477 | 0.054 | 0.58 |
| 53321 | 261.526 | 0.493 | 6.279 | 0.040 | 1.01 |
| 53322 | 266.907 | 0.504 | 3.174 | 0.020 | 0.98 |
| 53323 | 232.737 | 0.439 | 4.200 | 0.027 | 1.27 |
| 53324 | 132.614 | 0.250 | 6.580 | 0.042 | 2.94 |
| 53327 | 263.360 | 0.497 | 8.139 | 0.052 | 0.99 |
| 53328 | 142.051 | 0.268 | 6.985 | 0.045 | 2.67 |
| 53329 | 335.125 | 0.632 | 5.104 | 0.033 | 0.58 |
| 53330 | 386.443 | 0.729 | 13.134 | 0.084 | 0.35 |
| 53331 | 257.197 | 0.485 | 8.014 | 0.051 | 1.04 |
| 53332 | 222.693 | 0.420 | 3.190 | 0.020 | 1.37 |
| 53333 | 277.870 | 0.524 | 6.075 | 0.039 | 0.80 |
| 53334 | 200.723 | 0.379 | 16.918 | 0.108 | 1.51 |
| 53338 | 283.962 | 0.536 | 23.111 | 0.148 | 0.75 |
| 53339 | 244.136 | 0.461 | 8.614 | 0.055 | 1.14 |
| 53340 | 300.097 | 0.566 | 5.908 | 0.038 | 0.76 |
| 53341 | 349.011 | 0.659 | 12.573 | 0.080 | 0.49 |
| 53342 | 229.301 | 0.433 | 5.886 | 0.038 | 1.29 |
| 53343 | 172.251 | 0.325 | 4.904 | 0.031 | 2.05 |
| 53344 | 177.591 | 0.335 | 9.535 | 0.061 | 1.92 |
| 53345 | 220.779 | 0.417 | 21.381 | 0.137 | 1.24 |
| 53350 | 214.068 | 0.404 | 25.759 | 0.164 | 1.24 |
| 53351 | 208.510 | 0.393 | 10.288 | 0.066 | 1.49 |
| 53352 | 244.859 | 0.462 | 7.928 | 0.051 | 1.14 |
| 53353 | 296.344 | 0.559 | 8.553 | 0.055 | 0.77 |
| 53354 | 200.842 | 0.379 | 4.595 | 0.029 | 1.62 |
| 53355 | 149.196 | 0.282 | 5.227 | 0.033 | 2.52 |
| 53356 | 140.687 | 0.265 | 3.937 | 0.025 | 2.74 |
| 53357 | 102.633 | 0.194 | 22.495 | 0.144 | 3.40 |
| 53363 | 122.871 | 0.232 | 21.546 | 0.138 | 2.80 |
| 53364 | 159.115 | 0.300 | 3.850 | 0.025 | 2.31 |
| 53365 | 194.207 | 0.366 | 6.818 | 0.044 | 1.70 |
| 53366 | 240.273 | 0.453 | 5.939 | 0.038 | 1.19 |
| 53367 | 151.896 | 0.287 | 10.536 | 0.067 | 2.38 |
| 53368 | 137.498 | 0.259 | 4.384 | 0.028 | 2.83 |
| 53369 | 126.431 | 0.239 | 2.808 | 0.018 | 3.18 |
| 53370 | 102.063 | 0.193 | 5.591 | 0.036 | 4.11 |
| 53371 | 0.354 | 0.001 | 26.277 | 0.168 | HIGH |
| 53376 | 58.315 | 0.110 | 19.980 | 0.128 | 6.29 |
| 53377 | 95.454 | 0.180 | 5.401 | 0.034 | 4.47 |
| 53378 | 123.335 | 0.233 | 3.322 | 0.021 | 3.28 |
| 53379 | 150.325 | 0.284 | 3.796 | 0.024 | 2.51 |
| 53380 | 187.063 | 0.353 | 3.403 | 0.022 | 1.82 |
| 53382 | 100.046 | 0.189 | 5.023 | 0.032 | 4.23 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53383 | 85.856 | 0.162 | 0.527 | 0.003 | 5.17 |
| 53384 | 68.735 | 0.130 | 1.354 | 0.009 | 6.70 |
| 53385 | 32.111 | 0.061 | 1.865 | 0.012 | HIGH |
| 53386 | 65.155 | 0.123 | 18.224 | 0.116 | 5.84 |
| 53390 | 62.046 | 0.117 | 13.012 | 0.083 | 6.70 |
| 53391 | 43.086 | 0.081 | 1.574 | 0.010 | HIGH |
| 53392 | 65.673 | 0.124 | 1.410 | 0.009 | 7.05 |
| 53393 | 82.399 | 0.155 | 1.402 | 0.009 | 5.42 |
| 53394 | 105.943 | 0.200 | 0.973 | 0.006 | 4.00 |
| 53395 | 132.917 | 0.251 | 2.488 | 0.016 | 2.98 |
| 53397 | 135.190 | 0.255 | 12.120 | 0.077 | 2.75 |
| 53398 | 104.237 | 0.197 | 1.337 | 0.009 | 4.08 |
| 53399 | 87.781 | 0.166 | 2.269 | 0.014 | 5.02 |
| 53400 | 68.613 | 0.129 | 3.292 | 0.021 | 6.66 |
| 53401 | 24.682 | 0.047 | 3.538 | 0.023 | HIGH |
| 53402 | -53.091 | 0.100 | 3.132 | 0.020 | 8.88 |
| 53403 | -224.967 | 0.424 | 10.116 | 0.065 | 1.31 |
| 53406 | 93.053 | 0.176 | 8.089 | 0.052 | 4.52 |
| 53407 | 125.167 | 0.236 | 5.274 | 0.034 | 3.19 |
| 53408 | 136.171 | 0.257 | 3.219 | 0.021 | 2.88 |
| 53409 | 144.622 | 0.273 | 6.325 | 0.040 | 2.62 |
| 53410 | 139.302 | 0.263 | 6.842 | 0.044 | 2.75 |
| 53411 | 84.407 | 0.159 | 6.862 | 0.044 | 5.12 |
| 53412 | 86.002 | 0.162 | 6.632 | 0.042 | 5.02 |
| 53413 | -21.662 | 0.041 | 33.948 | 0.217 | 8.11 |
| 53415 | 134.231 | 0.253 | 7.190 | 0.046 | 2.88 |
| 53416 | 174.012 | 0.328 | 7.116 | 0.045 | 2.00 |
| 53417 | 198.285 | 0.374 | 8.682 | 0.055 | 1.63 |
| 53418 | 236.117 | 0.446 | 8.843 | 0.056 | 1.21 |
| 53419 | 193.041 | 0.364 | 9.072 | 0.058 | 1.69 |
| 53420 | 57.070 | 0.108 | 9.966 | 0.064 | 7.64 |
| 53421 | 0.335 | 0.001 | 4.173 | 0.027 | HIGH |
| 53424 | 192.364 | 0.363 | 12.392 | 0.079 | 1.67 |
| 53425 | 253.336 | 0.478 | 10.382 | 0.066 | 1.05 |
| 53426 | 354.465 | 0.669 | 13.988 | 0.089 | 0.46 |
| 53432 | 206.429 | 0.389 | 23.228 | 0.148 | 1.35 |
| 53433 | 236.092 | 0.445 | 29.965 | 0.191 | 1.00 |
| 53440 | 185.067 | 0.349 | 49.571 | 0.317 | 1.07 |
| 53450 | 129.978 | 0.245 | 69.975 | 0.447 | 1.04 |
| 53455 | 112.468 | 0.212 | 28.398 | 0.181 | 2.81 |
| 53456 | 211.001 | 0.398 | 12.980 | 0.083 | 1.43 |
| 53457 | 469.936 | 0.887 | 8.867 | 0.057 | 0.12 |
| 53463 | -58.164 | 0.110 | 12.884 | 0.082 | 7.17 |
| 53464 | 1.046 | 0.002 | 10.649 | 0.068 | HIGH |
| 53465 | -159.030 | 0.300 | 13.762 | 0.088 | 2.18 |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53467 | -17.050 | 0.032 | 24.105 | 0.154 | HIGH |
| 53470 | -111.057 | 0.210 | 13.279 | 0.085 | 3.49 |
| 53471 | -105.621 | 0.199 | 12.706 | 0.081 | 3.73 |
| 53472 | -161.300 | 0.304 | 8.968 | 0.057 | 2.21 |
| 53473 | -157.150 | 0.297 | 13.401 | 0.086 | 2.23 |
| 53474 | -34.545 | 0.065 | 19.753 | 0.126 | 9.88 |
| 53475 | -46.413 | 0.088 | 10.453 | 0.067 | 9.38 |
| 53476 | -83.293 | 0.157 | 10.383 | 0.066 | 5.03 |
| 53477 | -119.328 | 0.225 | 10.315 | 0.066 | 3.28 |
| 53478 | -155.474 | 0.293 | 4.956 | 0.032 | 2.38 |
| 53479 | -156.696 | 0.296 | 19.474 | 0.124 | 2.11 |
| 53480 | -45.083 | 0.085 | 11.648 | 0.074 | 9.45 |
| 53481 | -75.683 | 0.143 | 9.353 | 0.060 | 5.67 |
| 53482 | -103.382 | 0.195 | 8.986 | 0.057 | 3.96 |
| 53483 | -138.267 | 0.261 | 6.204 | 0.040 | 2.78 |
| 53484 | -146.003 | 0.275 | 17.792 | 0.114 | 2.36 |
| 53485 | -60.513 | 0.114 | 5.433 | 0.035 | 7.55 |
| 53486 | -83.563 | 0.158 | 5.855 | 0.037 | 5.22 |
| 53487 | -110.374 | 0.208 | 5.779 | 0.037 | 3.73 |
| 53488 | -120.229 | 0.227 | 12.542 | 0.080 | 3.19 |
| 53489 | -52.592 | 0.099 | 4.275 | 0.027 | 8.89 |
| 53490 | -77.417 | 0.146 | 4.203 | 0.027 | 5.76 |
| 53491 | -86.269 | 0.163 | 7.284 | 0.047 | 4.97 |
| 53492 | -37.574 | 0.071 | 4.181 | 0.027 | HIGH |
| 53493 | -42.464 | 0.080 | 4.494 | 0.029 | HIGH |
| 53494 | 28.690 | 0.054 | 4.456 | 0.028 | HIGH |
| 53499 | 9.155 | 0.017 | 6.215 | 0.040 | HIGH |
| 53500 | 76.320 | 0.144 | 3.242 | 0.021 | 5.89 |
| 53501 | 51.964 | 0.098 | 3.680 | 0.023 | 9.05 |
| 53502 | 29.509 | 0.056 | 2.832 | 0.018 | HIGH |
| 53503 | 4.261 | 0.008 | 1.782 | 0.011 | HIGH |
| 53504 | -18.960 | 0.036 | 0.361 | 0.002 | HIGH |
| 53505 | -40.760 | 0.077 | 0.550 | 0.004 | HIGH |
| 53506 | -64.055 | 0.121 | 2.784 | 0.018 | 7.22 |
| 53509 | 341.585 | 0.644 | 7.932 | 0.051 | 0.54 |
| 53510 | 173.847 | 0.328 | 7.518 | 0.048 | 2.00 |
| 53511 | 118.066 | 0.223 | 6.803 | 0.043 | 3.41 |
| 53512 | 81.824 | 0.154 | 5.016 | 0.032 | 5.38 |
| 53513 | 46.852 | 0.088 | 1.820 | 0.012 | HIGH |
| 53514 | 19.950 | 0.038 | 2.125 | 0.014 | HIGH |
| 53515 | -7.798 | 0.015 | 2.123 | 0.014 | HIGH |
| 53518 | 63.685 | 0.120 | 8.365 | 0.053 | 6.93 |
| 53519 | 60.071 | 0.113 | 12.492 | 0.080 | 6.98 |
| 53520 | 128.061 | 0.242 | 8.924 | 0.057 | 3.03 |
| 53521 | 133.570 | 0.252 | 8.335 | 0.053 | 2.88 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53522 | 97.455 | 0.184 | 6.423 | 0.041 | 4.33 |
| 53523 | 69.650 | 0.131 | 5.253 | 0.034 | 6.46 |
| 53524 | 45.815 | 0.086 | 5.408 | 0.035 | HIGH |
| 53530 | 138.953 | 0.262 | 12.867 | 0.082 | 2.64 |
| 53531 | 101.988 | 0.192 | 7.688 | 0.049 | 4.06 |
| 53532 | 72.591 | 0.137 | 9.222 | 0.059 | 5.94 |
| 53539 | 76.611 | 0.145 | 23.516 | 0.150 | 4.53 |
| 53540 | 75.494 | 0.142 | 18.708 | 0.119 | 5.00 |
| 53550 | 60.433 | 0.114 | 39.000 | 0.249 | 3.95 |
| 53553 | -233.525 | 0.441 | 19.816 | 0.127 | 1.14 |
| 53554 | -274.686 | 0.518 | 22.769 | 0.145 | 0.81 |
| 53559 | 72.650 | 0.137 | 49.364 | 0.315 | 2.71 |
| 53561 | -379.406 | 0.716 | 12.792 | 0.082 | 0.37 |
| 53562 | -365.682 | 0.690 | 8.434 | 0.054 | 0.44 |
| 53563 | -434.947 | 0.821 | 11.717 | 0.075 | 0.20 |
| 53568 | -292.404 | 0.552 | 9.334 | 0.060 | 0.79 |
| 53569 | -348.858 | 0.658 | 8.635 | 0.055 | 0.50 |
| 53570 | -403.794 | 0.762 | 10.729 | 0.069 | 0.30 |
| 53571 | -446.438 | 0.842 | 11.890 | 0.076 | 0.17 |
| 53574 | -71.388 | 0.135 | 30.401 | 0.194 | 4.22 |
| 53575 | -301.766 | 0.569 | 13.348 | 0.085 | 0.72 |
| 53576 | -324.390 | 0.612 | 4.127 | 0.026 | 0.63 |
| 53577 | -329.729 | 0.622 | 9.646 | 0.062 | 0.59 |
| 53578 | -291.843 | 0.551 | 10.221 | 0.065 | 0.79 |
| 53579 | -190.677 | 0.360 | 12.445 | 0.079 | 1.69 |
| 53580 | -129.992 | 0.245 | 24.128 | 0.154 | 2.53 |
| 53581 | -287.193 | 0.542 | 12.156 | 0.078 | 0.81 |
| 53582 | -284.798 | 0.537 | 6.254 | 0.040 | 0.85 |
| 53583 | -276.336 | 0.521 | 9.002 | 0.057 | 0.89 |
| 53584 | -252.094 | 0.476 | 9.611 | 0.061 | 1.07 |
| 53585 | -191.098 | 0.361 | 13.208 | 0.084 | 1.68 |
| 53586 | -248.921 | 0.470 | 7.364 | 0.047 | 1.11 |
| 53587 | -245.559 | 0.463 | 5.058 | 0.032 | 1.15 |
| 53588 | -234.546 | 0.443 | 5.207 | 0.033 | 1.25 |
| 53589 | -197.755 | 0.373 | 5.323 | 0.034 | 1.66 |
| 53590 | -171.178 | 0.323 | 2.169 | 0.014 | 2.09 |
| 53591 | -191.530 | 0.361 | 1.780 | 0.011 | 1.76 |
| 53592 | -162.688 | 0.307 | 4.420 | 0.028 | 2.24 |
| 53594 | -126.822 | 0.239 | 12.465 | 0.080 | 2.98 |
| 62201 | -28.423 | 0.054 | 26.670 | 0.170 | 9.12 |
| 62202 | -9.605 | 0.018 | 3.184 | 0.020 | HIGH |
| 62203 | 21.978 | 0.041 | 3.755 | 0.024 | HIGH |
| 62204 | -25.780 | 0.049 | 5.902 | 0.038 | HIGH |
| 62205 | 24.598 | 0.046 | 1.520 | 0.010 | HIGH |
| 62206 | 37.823 | 0.071 | 2.503 | 0.016 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62207 | 56.334 | 0.106 | 2.704 | 0.017 | 8.34 |
| 62208 | 27.394 | 0.052 | 1.999 | 0.013 | HIGH |
| 62215 | -71.964 | 0.136 | 21.622 | 0.138 | 4.99 |
| 62216 | -58.898 | 0.111 | 5.698 | 0.036 | 7.76 |
| 62222 | 35.039 | 0.066 | 0.676 | 0.004 | HIGH |
| 62223 | 40.322 | 0.076 | 1.426 | 0.009 | HIGH |
| 62224 | -92.231 | 0.174 | 31.096 | 0.199 | 3.29 |
| 62225 | -78.135 | 0.147 | 9.546 | 0.061 | 5.46 |
| 62226 | -45.120 | 0.085 | 2.398 | 0.015 | HIGH |
| 62227 | -19.947 | 0.038 | 3.072 | 0.020 | HIGH |
| 62228 | -7.016 | 0.013 | 2.767 | 0.018 | HIGH |
| 62229 | 1.608 | 0.003 | 1.690 | 0.011 | HIGH |
| 62230 | 7.116 | 0.013 | 1.094 | 0.007 | HIGH |
| 62231 | 8.453 | 0.016 | 1.330 | 0.008 | HIGH |
| 62232 | 18.784 | 0.035 | 0.900 | 0.006 | HIGH |
| 62233 | 27.400 | 0.052 | 5.002 | 0.032 | HIGH |
| 62234 | -82.580 | 0.156 | 16.965 | 0.108 | 4.67 |
| 62235 | -73.323 | 0.138 | 4.093 | 0.026 | 6.14 |
| 62236 | -60.567 | 0.114 | 1.775 | 0.011 | 7.72 |
| 62237 | -38.549 | 0.073 | 2.504 | 0.016 | HIGH |
| 62238 | -23.687 | 0.045 | 2.465 | 0.016 | HIGH |
| 62239 | -16.395 | 0.031 | 1.453 | 0.009 | HIGH |
| 62240 | -12.401 | 0.023 | 1.517 | 0.010 | HIGH |
| 62241 | -9.576 | 0.018 | 5.530 | 0.035 | HIGH |
| 62242 | -3.760 | 0.007 | 5.421 | 0.035 | HIGH |
| 62243 | 6.671 | 0.013 | 6.804 | 0.043 | HIGH |
| 62244 | 17.480 | 0.033 | 13.472 | 0.086 | HIGH |
| 62245 | -61.386 | 0.116 | 13.150 | 0.084 | 6.76 |
| 62246 | -81.970 | 0.155 | 0.539 | 0.003 | 5.46 |
| 62247 | -54.915 | 0.104 | 1.432 | 0.009 | 8.63 |
| 62248 | -48.479 | 0.091 | 1.083 | 0.007 | 9.91 |
| 62249 | -36.548 | 0.069 | 1.587 | 0.010 | HIGH |
| 62250 | -30.594 | 0.058 | 1.737 | 0.011 | HIGH |
| 62251 | -20.877 | 0.039 | 1.966 | 0.013 | HIGH |
| 62252 | -20.190 | 0.038 | 2.363 | 0.015 | HIGH |
| 62253 | -15.760 | 0.030 | 13.830 | 0.088 | HIGH |
| 62254 | -3.808 | 0.007 | 7.385 | 0.047 | HIGH |
| 62255 | -1.713 | 0.003 | 1.384 | 0.009 | HIGH |
| 62256 | 3.161 | 0.006 | 1.851 | 0.012 | HIGH |
| 62257 | -78.142 | 0.147 | 16.707 | 0.107 | 4.98 |
| 62258 | -50.411 | 0.095 | 8.875 | 0.057 | 8.83 |
| 62259 | -113.661 | 0.214 | 8.284 | 0.053 | 3.54 |
| 62260 | -45.932 | 0.087 | 1.943 | 0.012 | HIGH |
| 62261 | -43.627 | 0.082 | 0.615 | 0.004 | HIGH |
| 62262 | -38.879 | 0.073 | 0.737 | 0.005 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62263 | -30.569 | 0.058 | 0.493 | 0.003 | HIGH |
| 62264 | -27.276 | 0.051 | 2.653 | 0.017 | HIGH |
| 62265 | -28.665 | 0.054 | 3.213 | 0.021 | HIGH |
| 62266 | -17.465 | 0.033 | 4.111 | 0.026 | HIGH |
| 62267 | -7.661 | 0.014 | 1.293 | 0.008 | HIGH |
| 62268 | -7.450 | 0.014 | 1.291 | 0.008 | HIGH |
| 62269 | 1.212 | 0.002 | 1.516 | 0.010 | HIGH |
| 62270 | 61.678 | 0.116 | 1.460 | 0.009 | 7.57 |
| 62271 | 31.714 | 0.060 | 27.266 | 0.174 | 8.37 |
| 62272 | 43.007 | 0.081 | 9.285 | 0.059 | HIGH |
| 62273 | 34.165 | 0.064 | 4.440 | 0.028 | HIGH |
| 62274 | 44.165 | 0.083 | 4.977 | 0.032 | HIGH |
| 62275 | 66.532 | 0.126 | 7.570 | 0.048 | 6.66 |
| 62278 | 46.055 | 0.087 | 4.077 | 0.026 | HIGH |
| 62279 | 49.556 | 0.094 | 21.218 | 0.135 | 7.08 |
| 62280 | 54.067 | 0.102 | 5.972 | 0.038 | 8.50 |
| 62281 | 41.430 | 0.078 | 5.720 | 0.037 | HIGH |
| 62282 | 5.972 | 0.011 | 3.355 | 0.021 | HIGH |
| 62283 | 1.260 | 0.002 | 1.520 | 0.010 | HIGH |
| 62286 | 56.162 | 0.106 | 6.483 | 0.041 | 8.11 |
| 62287 | 57.864 | 0.109 | 4.231 | 0.027 | 8.01 |
| 62288 | 51.503 | 0.097 | 4.191 | 0.027 | 9.11 |
| 62289 | 29.692 | 0.056 | 4.182 | 0.027 | HIGH |
| 62290 | 4.864 | 0.009 | 11.552 | 0.074 | HIGH |
| 62293 | 64.530 | 0.122 | 3.119 | 0.020 | 7.14 |
| 62294 | 60.796 | 0.115 | 1.734 | 0.011 | 7.69 |
| 62295 | 49.022 | 0.092 | 2.157 | 0.014 | 9.75 |
| 62296 | 34.422 | 0.065 | 2.132 | 0.014 | HIGH |
| 62297 | 21.466 | 0.041 | 6.795 | 0.043 | HIGH |
| 62300 | 63.420 | 0.120 | 4.015 | 0.026 | 7.24 |
| 62301 | 57.648 | 0.109 | 1.383 | 0.009 | 8.17 |
| 62302 | 51.881 | 0.098 | 1.223 | 0.008 | 9.19 |
| 62303 | 40.790 | 0.077 | 1.293 | 0.008 | HIGH |
| 62304 | 36.296 | 0.068 | 6.445 | 0.041 | HIGH |
| 62308 | 58.758 | 0.111 | 5.603 | 0.036 | 7.79 |
| 62309 | 59.148 | 0.112 | 0.792 | 0.005 | 7.95 |
| 62310 | 51.632 | 0.097 | 3.765 | 0.024 | 9.11 |
| 62311 | 49.009 | 0.092 | 0.447 | 0.003 | 9.81 |
| 62312 | 44.909 | 0.085 | 5.037 | 0.032 | HIGH |
| 62316 | 57.780 | 0.109 | 8.483 | 0.054 | 7.69 |
| 62317 | 53.456 | 0.101 | 3.873 | 0.025 | 8.77 |
| 62318 | 52.899 | 0.100 | 3.770 | 0.024 | 8.87 |
| 62319 | 50.235 | 0.095 | 3.842 | 0.025 | 9.38 |
| 62320 | 47.353 | 0.089 | 4.229 | 0.027 | 9.97 |
| 62323 | 51.859 | 0.098 | 9.001 | 0.057 | 8.56 |

E01.5.5

S.S-104

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62324 | 52.672 | 0.099 | 6.286 | 0.040 | 8.71 |
| 62325 | 48.449 | 0.091 | 6.994 | 0.045 | 9.44 |
| 62326 | 42.255 | 0.080 | 5.284 | 0.034 | HIGH |
| 62327 | 33.475 | 0.063 | 2.814 | 0.018 | HIGH |
| 62329 | 63.732 | 0.120 | 22.576 | 0.144 | 5.49 |
| 62330 | 51.455 | 0.097 | 23.690 | 0.151 | 6.47 |
| 62331 | 38.249 | 0.072 | 6.338 | 0.040 | HIGH |
| 62332 | 32.722 | 0.062 | 4.608 | 0.029 | HIGH |
| 62333 | 27.073 | 0.051 | 3.043 | 0.019 | HIGH |
| 62334 | 52.354 | 0.099 | 21.274 | 0.136 | 6.74 |
| 62335 | 42.057 | 0.079 | 3.958 | 0.025 | HIGH |
| 62336 | 18.276 | 0.034 | 1.251 | 0.008 | HIGH |
| 62337 | 33.114 | 0.062 | 15.524 | 0.099 | HIGH |
| 62338 | 27.726 | 0.052 | 11.645 | 0.074 | HIGH |
| 62339 | 27.401 | 0.052 | 3.538 | 0.023 | HIGH |
| 62340 | 26.258 | 0.050 | 4.524 | 0.029 | HIGH |
| 62341 | 33.831 | 0.064 | 10.234 | 0.065 | HIGH |
| 62342 | 26.815 | 0.051 | 2.677 | 0.017 | HIGH |
| 62343 | 19.801 | 0.037 | 7.212 | 0.046 | HIGH |
| 62346 | 16.292 | 0.031 | 5.849 | 0.037 | HIGH |
| 62347 | 13.253 | 0.025 | 1.267 | 0.008 | HIGH |
| 62348 | 7.537 | 0.014 | 11.688 | 0.075 | HIGH |
| 62349 | 1.610 | 0.003 | 6.547 | 0.042 | HIGH |
| 62350 | -4.229 | 0.008 | 3.176 | 0.020 | HIGH |
| 62351 | -10.494 | 0.020 | 3.212 | 0.021 | HIGH |
| 62353 | 28.059 | 0.053 | 13.397 | 0.086 | HIGH |
| 62354 | 20.652 | 0.039 | 4.884 | 0.031 | HIGH |
| 62355 | 10.462 | 0.020 | 2.082 | 0.013 | HIGH |
| 62356 | 0.991 | 0.002 | 7.240 | 0.046 | HIGH |
| 62357 | -1.915 | 0.004 | 4.104 | 0.026 | HIGH |
| 62358 | -1.704 | 0.003 | 9.616 | 0.061 | HIGH |
| 62361 | 9.337 | 0.018 | 6.768 | 0.043 | HIGH |
| 62362 | 6.228 | 0.012 | 5.131 | 0.033 | HIGH |
| 62363 | 2.103 | 0.004 | 7.108 | 0.045 | HIGH |
| 62364 | -12.454 | 0.023 | 19.346 | 0.124 | HIGH |
| 62365 | -22.051 | 0.042 | 12.458 | 0.080 | HIGH |
| 62368 | -0.972 | 0.002 | 6.934 | 0.044 | HIGH |
| 62369 | -3.216 | 0.006 | 2.356 | 0.015 | HIGH |
| 62370 | -6.034 | 0.011 | 3.726 | 0.024 | HIGH |
| 62371 | -10.461 | 0.020 | 6.098 | 0.039 | HIGH |
| 62372 | -20.846 | 0.039 | 18.617 | 0.119 | HIGH |
| 62375 | -7.432 | 0.014 | 6.511 | 0.042 | HIGH |
| 62376 | -10.730 | 0.020 | 0.775 | 0.005 | HIGH |
| 62377 | -18.844 | 0.036 | 4.059 | 0.026 | HIGH |
| 62378 | -19.503 | 0.037 | 2.829 | 0.018 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62379 | -16.664 | 0.031 | 20.885 | 0.133 | HIGH |
| 62383 | -5.954 | 0.011 | 5.088 | 0.032 | HIGH |
| 62384 | -20.915 | 0.039 | 1.021 | 0.007 | HIGH |
| 62385 | -29.081 | 0.055 | 3.847 | 0.025 | HIGH |
| 62386 | -31.673 | 0.060 | 0.765 | 0.005 | HIGH |
| 62387 | -41.796 | 0.079 | 12.606 | 0.080 | 9.99 |
| 62390 | 1.458 | 0.003 | 3.386 | 0.022 | HIGH |
| 62391 | -20.393 | 0.038 | 0.472 | 0.003 | HIGH |
| 62392 | -35.160 | 0.066 | 0.609 | 0.004 | HIGH |
| 62393 | -41.045 | 0.077 | 1.046 | 0.007 | HIGH |
| 62394 | -51.894 | 0.098 | 8.692 | 0.056 | 8.59 |
| 62396 | 9.675 | 0.018 | 4.621 | 0.030 | HIGH |
| 62397 | -16.782 | 0.032 | 3.887 | 0.025 | HIGH |
| 62398 | -38.599 | 0.073 | 0.819 | 0.005 | HIGH |
| 62399 | -50.411 | 0.095 | 1.709 | 0.011 | 9.47 |
| 62400 | -53.508 | 0.101 | 6.224 | 0.040 | 8.57 |
| 62401 | -38.880 | 0.073 | 13.966 | 0.089 | HIGH |
| 62402 | -37.412 | 0.071 | 11.422 | 0.073 | HIGH |
| 62403 | -49.848 | 0.094 | 3.087 | 0.020 | 9.52 |
| 62404 | -56.078 | 0.105 | 2.497 | 0.016 | 8.39 |
| 62405 | -56.183 | 0.106 | 5.317 | 0.034 | 8.20 |
| 62406 | -76.021 | 0.143 | 30.977 | 0.198 | 3.95 |
| 62407 | -61.504 | 0.116 | 14.065 | 0.090 | 6.65 |
| 62408 | -69.669 | 0.131 | 6.254 | 0.040 | 6.41 |
| 62409 | -42.414 | 0.080 | 2.129 | 0.014 | HIGH |
| 62410 | -73.891 | 0.139 | 38.197 | 0.244 | 3.46 |
| 62411 | -27.696 | 0.052 | 16.844 | 0.108 | HIGH |
| 62412 | -87.327 | 0.165 | 3.643 | 0.023 | 5.02 |
| 62413 | -37.556 | 0.071 | 38.918 | 0.249 | 5.32 |
| 62414 | -54.852 | 0.103 | 6.463 | 0.041 | 8.32 |
| 62415 | -21.999 | 0.042 | 7.373 | 0.047 | HIGH |
| 63301 | 273.223 | 0.516 | 1.532 | 0.010 | 0.94 |
| 63302 | 45.500 | 0.086 | 10.151 | 0.065 | 9.62 |
| 63303 | -43.027 | 0.081 | 11.720 | 0.075 | 9.88 |
| 63304 | 160.425 | 0.303 | 4.906 | 0.031 | 2.28 |
| 63305 | 63.782 | 0.120 | 4.133 | 0.026 | 7.19 |
| 63306 | -34.902 | 0.066 | 10.039 | 0.064 | HIGH |
| 63307 | 72.073 | 0.136 | 3.440 | 0.022 | 6.29 |
| 63308 | -23.881 | 0.045 | 6.949 | 0.044 | HIGH |
| 63313 | 178.360 | 0.337 | 7.979 | 0.051 | 1.92 |
| 63314 | 213.246 | 0.402 | 2.525 | 0.016 | 1.48 |
| 63319 | 74.218 | 0.140 | 5.848 | 0.037 | 5.98 |
| 63320 | 49.522 | 0.093 | 4.113 | 0.026 | 9.51 |
| 63321 | 162.047 | 0.306 | 12.552 | 0.080 | 2.15 |
| 63322 | 195.507 | 0.369 | 3.222 | 0.021 | 1.70 |

S.S.105

S.S.106

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63323 | 125.779 | 0.237 | 7.305 | 0.047 | 3.13 |
| 63324 | 170.970 | 0.323 | 11.107 | 0.071 | 2.01 |
| 63327 | 100.913 | 0.190 | 9.549 | 0.061 | 4.05 |
| 63328 | 70.415 | 0.133 | 6.223 | 0.040 | 6.33 |
| 63329 | 71.220 | 0.134 | 4.386 | 0.028 | 6.34 |
| 63330 | 57.354 | 0.108 | 5.139 | 0.033 | 8.03 |
| 63331 | 144.713 | 0.273 | 12.428 | 0.079 | 2.51 |
| 63332 | 159.594 | 0.301 | 6.137 | 0.039 | 2.28 |
| 63333 | 146.990 | 0.277 | 8.316 | 0.053 | 2.53 |
| 63334 | 172.653 | 0.326 | 27.334 | 0.175 | 1.68 |
| 63338 | 76.655 | 0.145 | 23.322 | 0.149 | 4.55 |
| 63339 | 75.589 | 0.143 | 7.917 | 0.051 | 5.76 |
| 63340 | 49.683 | 0.094 | 3.908 | 0.025 | 9.49 |
| 63341 | 53.470 | 0.101 | 7.527 | 0.048 | 8.45 |
| 63342 | 118.518 | 0.224 | 8.780 | 0.056 | 3.35 |
| 63343 | 124.035 | 0.234 | 8.110 | 0.052 | 3.17 |
| 63344 | 117.181 | 0.221 | 10.387 | 0.066 | 3.35 |
| 63345 | 106.989 | 0.202 | 28.117 | 0.180 | 2.98 |
| 63350 | 60.136 | 0.113 | 25.677 | 0.164 | 5.42 |
| 63351 | 36.935 | 0.070 | 11.000 | 0.070 | HIGH |
| 63352 | 31.950 | 0.060 | 4.333 | 0.028 | HIGH |
| 63353 | 48.614 | 0.092 | 6.467 | 0.041 | 9.47 |
| 63354 | 94.449 | 0.178 | 6.222 | 0.040 | 4.50 |
| 63355 | 96.612 | 0.182 | 7.090 | 0.045 | 4.36 |
| 63356 | 86.344 | 0.163 | 3.967 | 0.025 | 5.08 |
| 63357 | 75.876 | 0.143 | 22.270 | 0.142 | 4.68 |
| 63363 | 21.910 | 0.041 | 22.906 | 0.146 | HIGH |
| 63364 | 28.040 | 0.053 | 5.101 | 0.033 | HIGH |
| 63365 | 31.168 | 0.059 | 4.873 | 0.031 | HIGH |
| 63366 | 56.857 | 0.107 | 5.234 | 0.033 | 8.10 |
| 63367 | 81.304 | 0.153 | 3.865 | 0.025 | 5.45 |
| 63368 | 81.700 | 0.154 | 4.225 | 0.027 | 5.41 |
| 63369 | 70.332 | 0.133 | 3.517 | 0.022 | 6.46 |
| 63370 | 63.474 | 0.120 | 5.843 | 0.037 | 7.13 |
| 63371 | 68.965 | 0.130 | 19.761 | 0.126 | 5.38 |
| 63376 | 3.122 | 0.006 | 23.156 | 0.148 | HIGH |
| 63377 | 24.966 | 0.047 | 6.414 | 0.041 | HIGH |
| 63378 | 29.080 | 0.055 | 1.829 | 0.012 | HIGH |
| 63379 | 38.331 | 0.072 | 4.532 | 0.029 | HIGH |
| 63380 | 65.901 | 0.124 | 8.820 | 0.056 | 6.64 |
| 63381 | 91.318 | 0.172 | 2.242 | 0.014 | 4.78 |
| 63382 | 80.607 | 0.152 | 1.410 | 0.009 | 5.56 |
| 63383 | 64.056 | 0.121 | 1.653 | 0.011 | 7.25 |
| 63384 | 55.320 | 0.104 | 1.418 | 0.009 | 8.56 |
| 63385 | 52.768 | 0.100 | 1.913 | 0.012 | 9.00 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63386 | 64.523 | 0.122 | 12.270 | 0.078 | 6.50 |
| 63390 | 41.313 | 0.078 | 14.915 | 0.095 | 9.61 |
| 63391 | 14.056 | 0.027 | 2.178 | 0.014 | HIGH |
| 63392 | 15.838 | 0.030 | 0.969 | 0.006 | HIGH |
| 63393 | 14.585 | 0.028 | 1.113 | 0.007 | HIGH |
| 63394 | 18.873 | 0.036 | 10.190 | 0.065 | HIGH |
| 63396 | -106.793 | 0.201 | 0.999 | 0.006 | 3.96 |
| 63397 | -83.048 | 0.157 | 0.537 | 0.003 | 5.38 |
| 63398 | -67.210 | 0.127 | 0.453 | 0.003 | 6.88 |
| 63399 | -54.565 | 0.103 | 1.983 | 0.013 | 8.67 |
| 63400 | -44.513 | 0.084 | 3.190 | 0.020 | HIGH |
| 63401 | -40.419 | 0.076 | 3.585 | 0.023 | HIGH |
| 63402 | -49.331 | 0.093 | 3.016 | 0.019 | 9.63 |
| 63403 | -105.633 | 0.199 | 13.782 | 0.088 | 3.68 |
| 63406 | -58.057 | 0.110 | 2.586 | 0.017 | 8.07 |
| 63407 | -47.046 | 0.089 | 2.607 | 0.017 | HIGH |
| 63408 | -35.599 | 0.067 | 1.976 | 0.013 | HIGH |
| 63409 | -25.253 | 0.048 | 5.375 | 0.034 | HIGH |
| 63410 | -18.306 | 0.035 | 7.288 | 0.047 | HIGH |
| 63411 | -5.638 | 0.011 | 7.391 | 0.047 | HIGH |
| 63412 | 58.219 | 0.110 | 7.422 | 0.047 | 7.72 |
| 63413 | 109.889 | 0.207 | 30.580 | 0.195 | 2.78 |
| 63415 | -30.324 | 0.057 | 5.550 | 0.035 | HIGH |
| 63416 | -25.603 | 0.048 | 5.413 | 0.035 | HIGH |
| 63417 | -18.637 | 0.035 | 6.390 | 0.041 | HIGH |
| 63418 | -8.079 | 0.015 | 8.631 | 0.055 | HIGH |
| 63419 | 2.183 | 0.004 | 9.273 | 0.059 | HIGH |
| 63420 | -29.888 | 0.056 | 13.055 | 0.083 | HIGH |
| 63421 | -46.636 | 0.088 | 2.997 | 0.019 | HIGH |
| 63424 | -21.623 | 0.041 | 9.410 | 0.060 | HIGH |
| 63425 | -22.083 | 0.042 | 7.543 | 0.048 | HIGH |
| 63426 | -27.389 | 0.052 | 12.935 | 0.083 | HIGH |
| 63432 | -20.582 | 0.039 | 17.895 | 0.114 | HIGH |
| 63433 | -39.499 | 0.075 | 22.629 | 0.145 | 8.23 |
| 63440 | 3.609 | 0.007 | 34.092 | 0.218 | HIGH |
| 63450 | 57.962 | 0.109 | 47.355 | 0.302 | 3.30 |
| 63455 | -97.347 | 0.184 | 28.576 | 0.182 | 3.26 |
| 63456 | -19.508 | 0.037 | 17.159 | 0.110 | HIGH |
| 63457 | 16.562 | 0.031 | 27.934 | 0.178 | HIGH |
| 63463 | -129.791 | 0.245 | 13.635 | 0.087 | 2.86 |
| 63464 | -85.013 | 0.160 | 11.569 | 0.074 | 4.85 |
| 63465 | -81.309 | 0.153 | 12.526 | 0.080 | 5.04 |
| 63467 | -51.028 | 0.096 | 19.041 | 0.122 | 7.24 |
| 63470 | -134.703 | 0.254 | 13.843 | 0.088 | 2.72 |
| 63471 | -111.563 | 0.210 | 13.382 | 0.085 | 3.46 |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63472 | -85.627 | 0.162 | 7.440 | 0.048 | 5.01 |
| 63473 | -60.566 | 0.114 | 8.901 | 0.057 | 7.27 |
| 63474 | -62.960 | 0.119 | 14.332 | 0.092 | 6.46 |
| 63475 | -66.127 | 0.125 | 11.536 | 0.074 | 6.40 |
| 63476 | -87.690 | 0.165 | 10.990 | 0.070 | 4.71 |
| 63477 | -93.631 | 0.177 | 10.914 | 0.070 | 4.37 |
| 63478 | -88.504 | 0.167 | 5.743 | 0.037 | 4.88 |
| 63479 | -78.421 | 0.148 | 11.777 | 0.075 | 5.30 |
| 63480 | -65.729 | 0.124 | 9.310 | 0.059 | 6.62 |
| 63481 | -76.084 | 0.144 | 10.445 | 0.067 | 5.57 |
| 63482 | -79.998 | 0.151 | 9.926 | 0.063 | 5.29 |
| 63483 | -82.939 | 0.156 | 7.473 | 0.048 | 5.20 |
| 63484 | -84.959 | 0.160 | 9.982 | 0.064 | 4.94 |
| 63485 | -59.096 | 0.112 | 7.906 | 0.050 | 7.56 |
| 63486 | -64.849 | 0.122 | 7.468 | 0.048 | 6.86 |
| 63487 | -73.873 | 0.139 | 6.152 | 0.039 | 6.00 |
| 63488 | -84.017 | 0.159 | 6.145 | 0.039 | 5.17 |
| 63489 | -37.304 | 0.070 | 7.226 | 0.046 | HIGH |
| 63490 | -45.909 | 0.087 | 3.271 | 0.021 | HIGH |
| 63491 | -59.844 | 0.113 | 2.965 | 0.019 | 7.78 |
| 63492 | -19.292 | 0.036 | 23.169 | 0.148 | HIGH |
| 63499 | -56.394 | 0.106 | 9.858 | 0.063 | 7.75 |
| 63500 | -7.436 | 0.014 | 3.885 | 0.025 | HIGH |
| 63501 | 21.267 | 0.040 | 4.059 | 0.026 | HIGH |
| 63502 | 38.710 | 0.073 | 3.591 | 0.023 | HIGH |
| 63503 | 45.923 | 0.087 | 2.120 | 0.014 | HIGH |
| 63504 | 44.025 | 0.083 | 1.298 | 0.008 | HIGH |
| 63505 | 31.502 | 0.059 | 11.448 | 0.073 | HIGH |
| 63509 | 18.790 | 0.035 | 7.571 | 0.048 | HIGH |
| 63510 | 24.921 | 0.047 | 7.625 | 0.049 | HIGH |
| 63511 | 50.685 | 0.096 | 7.637 | 0.049 | 8.93 |
| 63512 | 55.642 | 0.105 | 6.230 | 0.040 | 8.21 |
| 63513 | 52.534 | 0.099 | 2.822 | 0.018 | 9.00 |
| 63514 | 43.340 | 0.082 | 4.569 | 0.029 | HIGH |
| 63515 | 34.424 | 0.065 | 8.676 | 0.055 | HIGH |
| 63518 | -85.526 | 0.161 | 3.454 | 0.022 | 5.15 |
| 63519 | -16.595 | 0.031 | 12.083 | 0.077 | HIGH |
| 63520 | 47.845 | 0.090 | 9.390 | 0.060 | 9.23 |
| 63521 | 71.061 | 0.134 | 8.914 | 0.057 | 6.11 |
| 63522 | 64.981 | 0.123 | 7.777 | 0.050 | 6.82 |
| 63523 | 60.896 | 0.115 | 5.902 | 0.038 | 7.47 |
| 63524 | 54.773 | 0.103 | 6.212 | 0.040 | 8.36 |
| 63530 | 101.754 | 0.192 | 13.496 | 0.086 | 3.86 |
| 63531 | 80.064 | 0.151 | 9.589 | 0.061 | 5.31 |
| 63532 | 69.738 | 0.132 | 10.329 | 0.066 | 6.13 |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: LANDING ABORT LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63539 | 71.206 | 0.134 | 25.742 | 0.164 | 4.66 |
| 63540 | 76.833 | 0.145 | 19.208 | 0.123 | 4.87 |
| 63550 | 91.630 | 0.173 | 40.426 | 0.258 | 2.75 |
| 63553 | 52.377 | 0.099 | 19.579 | 0.125 | 6.99 |
| 63554 | -10.760 | 0.020 | 31.586 | 0.202 | HIGH |
| 63559 | 94.974 | 0.179 | 61.665 | 0.394 | 1.67 |
| 63561 | -46.772 | 0.088 | 14.923 | 0.095 | 8.56 |
| 63562 | 16.500 | 0.031 | 12.641 | 0.081 | HIGH |
| 63563 | -13.614 | 0.026 | 14.959 | 0.096 | HIGH |
| 63568 | 38.641 | 0.073 | 12.851 | 0.082 | HIGH |
| 63569 | 0.718 | 0.001 | 9.983 | 0.064 | HIGH |
| 63570 | 13.287 | 0.025 | 14.442 | 0.092 | HIGH |
| 63571 | 23.461 | 0.044 | 15.070 | 0.096 | HIGH |
| 63574 | -24.029 | 0.045 | 18.171 | 0.116 | HIGH |
| 63575 | 28.990 | 0.055 | 19.401 | 0.124 | HIGH |
| 63576 | 5.633 | 0.011 | 5.184 | 0.033 | HIGH |
| 63577 | 12.489 | 0.024 | 11.178 | 0.071 | HIGH |
| 63578 | 22.939 | 0.043 | 11.202 | 0.072 | HIGH |
| 63579 | 17.511 | 0.033 | 10.693 | 0.068 | HIGH |
| 63580 | -7.407 | 0.014 | 16.002 | 0.102 | HIGH |
| 63581 | 22.328 | 0.042 | 17.539 | 0.112 | HIGH |
| 63582 | 9.103 | 0.017 | 6.699 | 0.043 | HIGH |
| 63583 | 19.368 | 0.037 | 9.406 | 0.060 | HIGH |
| 63584 | 26.244 | 0.050 | 9.719 | 0.062 | HIGH |
| 63585 | 25.899 | 0.049 | 9.597 | 0.061 | HIGH |
| 63586 | 24.359 | 0.046 | 12.069 | 0.077 | HIGH |
| 63587 | 16.812 | 0.032 | 6.018 | 0.038 | HIGH |
| 63588 | 28.183 | 0.053 | 6.061 | 0.039 | HIGH |
| 63589 | 32.952 | 0.062 | 5.798 | 0.037 | HIGH |
| 63590 | 31.121 | 0.059 | 6.686 | 0.043 | HIGH |
| 63591 | 27.077 | 0.051 | 4.043 | 0.026 | HIGH |
| 63592 | 37.042 | 0.070 | 4.074 | 0.026 | HIGH |
| 63593 | 41.552 | 0.078 | 3.905 | 0.025 | HIGH |
| 63594 | 37.819 | 0.071 | 3.055 | 0.020 | HIGH |
| 63595 | 69.816 | 0.132 | 4.340 | 0.028 | 6.48 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: REGULAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12201 | -79.466 | 0.150 | 5.348 | 0.034 | 5.55 |
| 12202 | 9.569 | 0.018 | 30.210 | 0.193 | HIGH |
| 12204 | -158.730 | 0.299 | 25.226 | 0.161 | 1.94 |
| 12205 | -41.753 | 0.079 | 0.508 | 0.003 | HIGH |
| 12206 | -67.909 | 0.128 | 2.692 | 0.017 | 6.76 |
| 12207 | -104.757 | 0.198 | 2.063 | 0.013 | 4.05 |
| 12208 | -27.089 | 0.051 | 1.711 | 0.011 | HIGH |
| 12215 | -63.797 | 0.120 | 27.364 | 0.175 | 4.97 |
| 12216 | -55.411 | 0.105 | 101.813 | 0.650 | 0.74 |
| 12222 | -88.081 | 0.166 | 1.211 | 0.008 | 5.01 |
| 12223 | -117.706 | 0.222 | 1.762 | 0.011 | 3.49 |
| 12224 | -34.517 | 0.065 | 18.634 | 0.119 | HIGH |
| 12225 | -31.717 | 0.060 | 62.881 | 0.402 | 2.81 |
| 12226 | 24.468 | 0.046 | 31.687 | 0.202 | 8.33 |
| 12227 | -360.519 | 0.680 | 53.098 | 0.339 | 0.20 |
| 12228 | -218.272 | 0.412 | 49.749 | 0.318 | 0.83 |
| 12229 | -146.891 | 0.277 | 58.162 | 0.371 | 1.20 |
| 12230 | -86.155 | 0.163 | 9.510 | 0.061 | 4.88 |
| 12231 | -86.495 | 0.163 | 5.070 | 0.032 | 5.04 |
| 12232 | -138.840 | 0.262 | 2.555 | 0.016 | 2.81 |
| 12233 | -148.578 | 0.280 | 11.081 | 0.071 | 2.45 |
| 12234 | -25.379 | 0.048 | 8.398 | 0.054 | HIGH |
| 12235 | -13.397 | 0.025 | 28.884 | 0.184 | HIGH |
| 12236 | 68.844 | 0.130 | 21.952 | 0.140 | 5.17 |
| 12237 | 94.714 | 0.179 | 28.005 | 0.179 | 3.39 |
| 12238 | -189.908 | 0.358 | 62.253 | 0.398 | 0.79 |
| 12239 | 10.186 | 0.019 | 46.357 | 0.296 | 6.25 |
| 12240 | -139.697 | 0.264 | 97.254 | 0.621 | 0.43 |
| 12241 | -128.240 | 0.242 | 103.874 | 0.663 | 0.37 |
| 12242 | -136.139 | 0.257 | 58.403 | 0.373 | 1.30 |
| 12243 | -147.247 | 0.278 | 11.771 | 0.075 | 2.46 |
| 12244 | -153.864 | 0.290 | 9.849 | 0.063 | 2.35 |
| 12245 | -34.156 | 0.064 | 0.827 | 0.005 | HIGH |
| 12246 | -29.002 | 0.055 | 5.664 | 0.036 | HIGH |
| 12247 | 79.708 | 0.150 | 48.958 | 0.313 | 2.56 |
| 12248 | 97.451 | 0.184 | 43.030 | 0.275 | 2.47 |
| 12249 | -118.182 | 0.223 | 43.467 | 0.278 | 2.04 |
| 12250 | -26.023 | 0.049 | 12.904 | 0.082 | HIGH |
| 12251 | -204.867 | 0.387 | 448.069 | 2.861 | -0.85 |
| 12252 | -25.585 | 0.048 | 1.120 | 0.007 | HIGH |
| 12253 | -217.664 | 0.411 | 377.742 | 2.412 | -0.80 |
| 12254 | -159.866 | 0.302 | 34.674 | 0.221 | 1.68 |
| 12255 | -142.270 | 0.268 | 25.822 | 0.165 | 2.21 |
| 12256 | -141.518 | 0.267 | 14.411 | 0.092 | 2.54 |
| 12257 | -39.800 | 0.075 | 1.870 | 0.012 | HIGH |

011'55

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: R&J LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12258 | -39.253 | 0.074 | 2.104 | 0.013 | HIGH |
| 12259 | -28.702 | 0.054 | 5.302 | 0.034 | HIGH |
| 12260 | 70.970 | 0.134 | 26.227 | 0.167 | 4.63 |
| 12261 | -123.695 | 0.233 | 70.065 | 0.447 | 1.09 |
| 12262 | -87.124 | 0.164 | 1.981 | 0.013 | 5.07 |
| 12263 | 40.865 | 0.077 | 17.067 | 0.109 | 9.23 |
| 12264 | -115.852 | 0.219 | 198.619 | 1.268 | -0.42 |
| 12265 | -112.179 | 0.212 | 166.131 | 1.061 | -0.24 |
| 12266 | -119.999 | 0.226 | 58.175 | 0.371 | 1.48 |
| 12267 | -111.956 | 0.211 | 14.873 | 0.095 | 3.40 |
| 12268 | -107.357 | 0.203 | 13.751 | 0.088 | 3.61 |
| 12269 | -119.283 | 0.225 | 6.374 | 0.041 | 3.37 |
| 12270 | 2.239 | 0.004 | 3.524 | 0.023 | HIGH |
| 12271 | -1.237 | 0.002 | 2.236 | 0.014 | HIGH |
| 12272 | -7.817 | 0.015 | 4.407 | 0.028 | HIGH |
| 12273 | -22.616 | 0.043 | 2.623 | 0.017 | HIGH |
| 12274 | -24.450 | 0.046 | 9.557 | 0.061 | HIGH |
| 12275 | 7.307 | 0.014 | 39.081 | 0.250 | 8.81 |
| 12278 | -2.899 | 0.005 | 8.140 | 0.052 | HIGH |
| 12279 | -18.898 | 0.036 | 1.212 | 0.008 | HIGH |
| 12280 | 8.003 | 0.015 | 2.637 | 0.017 | HIGH |
| 12281 | -94.377 | 0.178 | 19.545 | 0.125 | 3.90 |
| 12282 | -138.282 | 0.261 | 25.258 | 0.161 | 2.31 |
| 12283 | -61.319 | 0.116 | 102.046 | 0.652 | 0.70 |
| 12286 | -23.205 | 0.044 | 10.372 | 0.066 | HIGH |
| 12287 | -66.005 | 0.125 | 6.744 | 0.043 | 6.78 |
| 12288 | -73.032 | 0.138 | 15.057 | 0.096 | 5.48 |
| 12289 | -114.609 | 0.216 | 24.515 | 0.157 | 2.92 |
| 12290 | -202.991 | 0.383 | 25.981 | 0.166 | 1.35 |
| 12293 | -71.253 | 0.134 | 49.663 | 0.317 | 2.72 |
| 12294 | -64.861 | 0.122 | 17.895 | 0.114 | 5.90 |
| 12295 | 35.669 | 0.067 | 13.504 | 0.086 | HIGH |
| 12296 | -251.773 | 0.475 | 28.955 | 0.185 | 0.90 |
| 12297 | -435.100 | 0.821 | 34.404 | 0.220 | 0.12 |
| 12300 | -56.797 | 0.107 | 75.071 | 0.479 | 1.61 |
| 12301 | -96.804 | 0.183 | 22.285 | 0.142 | 3.64 |
| 12302 | -175.952 | 0.332 | 22.351 | 0.143 | 1.74 |
| 12303 | -282.446 | 0.533 | 32.745 | 0.209 | 0.67 |
| 12304 | -228.407 | 0.431 | 33.548 | 0.214 | 1.01 |
| 12308 | -31.499 | 0.059 | 26.765 | 0.171 | 8.54 |
| 12309 | -84.314 | 0.159 | 25.704 | 0.164 | 3.97 |
| 12310 | -162.367 | 0.306 | 61.892 | 0.395 | 0.99 |
| 12311 | -216.217 | 0.408 | 59.775 | 0.382 | 0.69 |
| 12312 | -180.996 | 0.342 | 6.799 | 0.043 | 1.89 |
| 12316 | -7.807 | 0.015 | 23.538 | 0.150 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: RADIAL LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12317 | -45.146 | 0.065 | 273.903 | 1.749 | -0.64 |
| 12318 | -116.897 | 0.221 | 126.846 | 0.810 | 0.10 |
| 12319 | -128.024 | 0.242 | 115.798 | 0.739 | 0.20 |
| 12320 | -117.105 | 0.221 | 5.394 | 0.034 | 3.47 |
| 12323 | 61.107 | 0.115 | 206.007 | 1.315 | -0.42 |
| 12324 | 0.797 | 0.002 | 1.561 | 0.010 | HIGH |
| 12325 | -101.851 | 0.192 | 359.926 | 2.298 | -0.78 |
| 12326 | -93.171 | 0.176 | 138.798 | 0.886 | 0.01 |
| 12327 | -34.965 | 0.066 | 1.016 | 0.006 | HIGH |
| 12329 | 13.780 | 0.026 | 152.160 | 0.972 | 0.02 |
| 12330 | 18.655 | 0.035 | 135.661 | 0.866 | 0.23 |
| 12331 | -38.300 | 0.072 | 87.499 | 0.559 | 1.31 |
| 12332 | -26.705 | 0.050 | 50.161 | 0.320 | 4.35 |
| 12333 | 7.437 | 0.014 | 6.073 | 0.039 | HIGH |
| 12334 | 30.768 | 0.058 | 99.130 | 0.633 | 0.97 |
| 12335 | 19.944 | 0.038 | 52.265 | 0.334 | 4.43 |
| 12336 | 2.707 | 0.005 | 23.431 | 0.150 | HIGH |
| 12337 | 10.612 | 0.020 | 20.217 | 0.129 | HIGH |
| 12338 | 29.903 | 0.056 | 31.174 | 0.199 | 7.64 |
| 12339 | 22.801 | 0.043 | 19.875 | 0.127 | HIGH |
| 12340 | 22.249 | 0.042 | 8.551 | 0.055 | HIGH |
| 12341 | 15.108 | 0.029 | 5.369 | 0.034 | HIGH |
| 12342 | 24.716 | 0.047 | 5.890 | 0.038 | HIGH |
| 12343 | 2.295 | 0.004 | 2.370 | 0.015 | HIGH |
| 12346 | 5.210 | 0.010 | 1.676 | 0.011 | HIGH |
| 12347 | 18.895 | 0.036 | 2.138 | 0.014 | HIGH |
| 12348 | 20.340 | 0.038 | 23.029 | 0.147 | HIGH |
| 12349 | 24.858 | 0.047 | 18.021 | 0.115 | HIGH |
| 12350 | 21.913 | 0.041 | 7.502 | 0.048 | HIGH |
| 12351 | 32.569 | 0.061 | 7.570 | 0.048 | HIGH |
| 12353 | -22.882 | 0.043 | 1.702 | 0.011 | HIGH |
| 12354 | 32.829 | 0.062 | 0.747 | 0.005 | HIGH |
| 12355 | 7.398 | 0.014 | 106.076 | 0.677 | 0.92 |
| 12356 | 18.460 | 0.035 | 54.640 | 0.349 | 4.18 |
| 12357 | 1.298 | 0.002 | 22.592 | 0.144 | HIGH |
| 12358 | -0.533 | 0.001 | 23.281 | 0.149 | HIGH |
| 12361 | 65.024 | 0.123 | 1.356 | 0.009 | 7.13 |
| 12362 | 39.285 | 0.074 | 154.404 | 0.986 | -0.05 |
| 12363 | 46.536 | 0.088 | 128.818 | 0.823 | 0.25 |
| 12364 | -10.852 | 0.020 | 80.218 | 0.512 | 2.03 |
| 12365 | -15.635 | 0.029 | 56.471 | 0.361 | 4.07 |
| 12368 | 193.292 | 0.365 | 4.301 | 0.027 | 1.73 |
| 12369 | 101.248 | 0.191 | 94.555 | 0.604 | 0.65 |
| 12370 | 80.122 | 0.170 | 145.009 | 0.926 | -0.04 |
| 12371 | -43.493 | 0.082 | 200.375 | 1.280 | -0.38 |

S.S.112

S.S.113

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: REGULAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12372 | -31.395 | 0.059 | 137.974 | 0.881 | 0.16 |
| 12375 | 331.845 | 0.626 | 30.811 | 0.197 | 0.46 |
| 12376 | 121.438 | 0.229 | 19.463 | 0.124 | 2.92 |
| 12377 | 66.607 | 0.126 | 160.525 | 1.025 | -0.15 |
| 12378 | -5.592 | 0.011 | 1.057 | 0.007 | HIGH |
| 12379 | -12.541 | 0.024 | 161.287 | 1.030 | -0.07 |
| 12383 | 448.331 | 0.846 | 29.335 | 0.187 | 0.11 |
| 12384 | 285.156 | 0.538 | 24.556 | 0.157 | 0.73 |
| 12385 | 182.336 | 0.344 | 10.108 | 0.065 | 1.84 |
| 12386 | -4.092 | 0.008 | 18.645 | 0.119 | HIGH |
| 12387 | -14.197 | 0.027 | 90.505 | 0.578 | 1.44 |
| 12390 | 202.151 | 0.381 | 25.337 | 0.162 | 1.37 |
| 12391 | 141.989 | 0.268 | 18.084 | 0.115 | 2.44 |
| 12392 | 163.446 | 0.308 | 39.254 | 0.251 | 1.52 |
| 12393 | 76.270 | 0.144 | 19.421 | 0.124 | 4.89 |
| 12394 | 27.299 | 0.052 | 20.485 | 0.131 | HIGH |
| 12396 | 17.465 | 0.033 | 46.606 | 0.298 | 5.54 |
| 12397 | 195.215 | 0.368 | 13.802 | 0.088 | 1.61 |
| 12398 | 178.275 | 0.336 | 28.306 | 0.181 | 1.59 |
| 12399 | 73.164 | 0.138 | 24.344 | 0.155 | 4.66 |
| 12400 | 9.347 | 0.018 | 49.390 | 0.315 | 5.65 |
| 12401 | 48.751 | 0.092 | 16.050 | 0.102 | 8.05 |
| 12402 | 46.900 | 0.088 | 14.205 | 0.091 | 8.66 |
| 12403 | 141.367 | 0.267 | 1.702 | 0.011 | 2.74 |
| 12404 | 117.953 | 0.223 | 17.832 | 0.114 | 3.08 |
| 12405 | -138.260 | 0.261 | 199.786 | 1.276 | -0.44 |
| 12406 | 41.186 | 0.078 | 6.097 | 0.039 | HIGH |
| 12407 | 23.742 | 0.045 | 15.136 | 0.097 | HIGH |
| 12408 | 49.215 | 0.093 | 15.734 | 0.100 | 8.03 |
| 12409 | 14.744 | 0.028 | 27.712 | 0.177 | HIGH |
| 12410 | 31.017 | 0.059 | 6.812 | 0.044 | HIGH |
| 12411 | 23.631 | 0.045 | 3.780 | 0.024 | HIGH |
| 12412 | 20.317 | 0.038 | 4.219 | 0.027 | HIGH |
| 12413 | 32.334 | 0.061 | 4.478 | 0.029 | HIGH |
| 12414 | 30.250 | 0.057 | 5.119 | 0.033 | HIGH |
| 12415 | 29.035 | 0.055 | 3.644 | 0.023 | HIGH |
| 12425 | -149.838 | 0.283 | 132.630 | 0.847 | -0.03 |
| 12426 | 253.347 | 0.478 | 57.210 | 0.365 | 0.54 |
| 12427 | -2.778 | 0.005 | 35.773 | 0.228 | HIGH |
| 12443 | 82.961 | 0.157 | 42.294 | 0.270 | 2.88 |
| 12444 | 82.133 | 0.155 | 45.070 | 0.288 | 2.73 |
| 12445 | 100.138 | 0.189 | 41.306 | 0.264 | 2.50 |
| 12446 | 38.632 | 0.073 | 22.332 | 0.143 | 8.44 |
| 12447 | -10.462 | 0.020 | 27.186 | 0.174 | HIGH |
| 12455 | -206.529 | 0.390 | 20.884 | 0.133 | 1.39 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: [illegible]LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12456 | -287.035 | 0.542 | 55.787 | 0.356 | 0.42 |
| 12463 | -27.399 | 0.052 | 95.649 | 0.611 | 1.11 |
| 12464 | -36.982 | 0.070 | 41.093 | 0.262 | 5.02 |
| 12465 | 136.021 | 0.257 | 139.854 | 0.893 | -0.07 |
| 13301 | 323.218 | 0.610 | 4.898 | 0.031 | 0.63 |
| 13302 | -224.232 | 0.423 | 2.323 | 0.015 | 1.36 |
| 13303 | -246.605 | 0.465 | 1.383 | 0.009 | 1.15 |
| 13304 | 467.699 | 0.882 | 1.849 | 0.012 | 0.13 |
| 13305 | 13.121 | 0.025 | 1.237 | 0.008 | HIGH |
| 13306 | 73.462 | 0.139 | 1.206 | 0.008 | 6.20 |
| 13307 | 25.016 | 0.047 | 1.156 | 0.007 | HIGH |
| 13308 | 19.294 | 0.036 | 1.847 | 0.012 | HIGH |
| 13313 | 299.211 | 0.565 | 10.626 | 0.068 | 0.74 |
| 13314 | 387.613 | 0.731 | 1.259 | 0.008 | 0.37 |
| 13319 | 51.072 | 0.096 | 0.361 | 0.002 | 9.37 |
| 13320 | 71.781 | 0.135 | 0.782 | 0.005 | 6.38 |
| 13321 | 375.217 | 0.708 | 12.233 | 0.078 | 0.39 |
| 13322 | 379.597 | 0.716 | 4.170 | 0.027 | 0.39 |
| 13323 | 257.820 | 0.486 | 1.595 | 0.010 | 1.05 |
| 13324 | 184.519 | 0.348 | 1.614 | 0.010 | 1.87 |
| 13325 | 110.939 | 0.209 | 1.413 | 0.009 | 3.77 |
| 13326 | 43.761 | 0.083 | 1.188 | 0.008 | HIGH |
| 13327 | 33.594 | 0.063 | 0.939 | 0.006 | HIGH |
| 13328 | 43.544 | 0.082 | 0.542 | 0.003 | HIGH |
| 13329 | 81.611 | 0.154 | 0.633 | 0.004 | 5.49 |
| 13330 | 101.603 | 0.192 | 1.822 | 0.012 | 4.21 |
| 13331 | 322.792 | 0.609 | 9.609 | 0.061 | 0.62 |
| 13332 | 285.426 | 0.539 | 5.839 | 0.037 | 0.85 |
| 13333 | 237.719 | 0.449 | 1.336 | 0.009 | 1.23 |
| 13334 | 145.058 | 0.274 | 1.313 | 0.008 | 2.65 |
| 13335 | 94.493 | 0.178 | 1.094 | 0.007 | 4.60 |
| 13336 | 55.743 | 0.105 | 0.936 | 0.006 | 8.50 |
| 13337 | 39.149 | 0.074 | 0.710 | 0.005 | HIGH |
| 13338 | 47.979 | 0.091 | 0.434 | 0.003 | HIGH |
| 13339 | 70.956 | 0.134 | 0.505 | 0.003 | 6.47 |
| 13340 | 101.801 | 0.192 | 0.555 | 0.004 | 4.20 |
| 13341 | 109.868 | 0.207 | 1.810 | 0.012 | 3.81 |
| 13342 | 261.573 | 0.494 | 4.785 | 0.031 | 1.02 |
| 13343 | 219.252 | 0.414 | 5.536 | 0.035 | 1.40 |
| 13344 | 200.638 | 0.379 | 1.927 | 0.012 | 1.64 |
| 13345 | 147.001 | 0.277 | 1.134 | 0.007 | 2.60 |
| 13346 | 90.872 | 0.171 | 1.088 | 0.007 | 4.83 |
| 13347 | 58.825 | 0.111 | 0.443 | 0.003 | 8.01 |
| 13348 | 44.397 | 0.084 | 0.277 | 0.002 | HIGH |
| 13349 | 43.676 | 0.082 | 0.308 | 0.002 | HIGH |

411.3.5

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: REV LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13350 | 61.381 | 0.116 | 0.544 | 0.003 | 7.63 |
| 13351 | 83.629 | 0.158 | 0.563 | 0.004 | 5.34 |
| 13352 | 106.464 | 0.201 | 0.730 | 0.005 | 3.98 |
| 13353 | 110.812 | 0.209 | 1.592 | 0.010 | 3.78 |
| 13354 | 186.073 | 0.351 | 2.782 | 0.018 | 1.84 |
| 13355 | 170.208 | 0.321 | 4.031 | 0.026 | 2.10 |
| 13356 | 166.833 | 0.315 | 2.005 | 0.013 | 2.17 |
| 13357 | 138.217 | 0.261 | 0.641 | 0.004 | 2.83 |
| 13358 | 99.298 | 0.187 | 0.633 | 0.004 | 4.34 |
| 13359 | 66.954 | 0.126 | 0.600 | 0.004 | 6.91 |
| 13360 | 50.856 | 0.096 | 0.175 | 0.001 | 9.42 |
| 13361 | 48.093 | 0.091 | 0.272 | 0.002 | HIGH |
| 13362 | 50.833 | 0.096 | 0.501 | 0.003 | 9.42 |
| 13363 | 67.327 | 0.127 | 0.510 | 0.003 | 6.87 |
| 13364 | 87.239 | 0.165 | 0.425 | 0.003 | 5.07 |
| 13365 | 106.458 | 0.201 | 0.814 | 0.005 | 3.98 |
| 13366 | 112.230 | 0.212 | 0.884 | 0.006 | 3.72 |
| 13367 | 98.511 | 0.186 | 18.685 | 0.119 | 3.76 |
| 13368 | 134.982 | 0.255 | 4.314 | 0.028 | 2.90 |
| 13369 | 137.835 | 0.260 | 0.746 | 0.005 | 2.84 |
| 13370 | 123.376 | 0.233 | 0.219 | 0.001 | 3.30 |
| 13371 | 100.109 | 0.189 | 0.319 | 0.002 | 4.29 |
| 13372 | 77.268 | 0.146 | 0.312 | 0.002 | 5.86 |
| 13373 | 61.208 | 0.115 | 0.145 | 0.001 | 7.66 |
| 13374 | 52.816 | 0.100 | 0.126 | 0.001 | 9.03 |
| 13375 | 53.098 | 0.100 | 0.380 | 0.002 | 8.98 |
| 13376 | 56.594 | 0.107 | 0.420 | 0.003 | 8.36 |
| 13377 | 69.691 | 0.131 | 0.420 | 0.003 | 6.60 |
| 13378 | 86.914 | 0.164 | 0.253 | 0.002 | 5.10 |
| 13379 | 100.144 | 0.189 | 0.537 | 0.003 | 4.29 |
| 13380 | 96.902 | 0.183 | 3.700 | 0.024 | 4.43 |
| 13382 | 111.318 | 0.210 | 8.537 | 0.055 | 3.63 |
| 13383 | 103.992 | 0.196 | 2.361 | 0.015 | 4.08 |
| 13384 | 99.573 | 0.188 | 0.141 | 0.001 | 4.32 |
| 13385 | 90.150 | 0.170 | 0.108 | 0.001 | 4.88 |
| 13386 | 80.419 | 0.152 | 0.128 | 0.001 | 5.59 |
| 13387 | 72.630 | 0.137 | 0.178 | 0.001 | 6.30 |
| 13388 | 66.472 | 0.125 | 0.242 | 0.002 | 6.97 |
| 13389 | 60.095 | 0.113 | 0.133 | 0.001 | 7.82 |
| 13390 | 55.279 | 0.104 | 0.295 | 0.002 | 8.59 |
| 13391 | 57.596 | 0.109 | 0.286 | 0.002 | 8.20 |
| 13392 | 68.018 | 0.128 | 0.138 | 0.001 | 6.79 |
| 13393 | 89.084 | 0.168 | 0.546 | 0.003 | 4.95 |
| 13394 | 119.164 | 0.225 | 1.118 | 0.007 | 3.44 |
| 13397 | 272.997 | 0.515 | 20.869 | 0.133 | 0.84 |

S11'S'S

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: RADIAL LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13398 | 193.783 | 0.366 | 4.368 | 0.028 | 1.72 |
| 13399 | 153.966 | 0.291 | 0.458 | 0.003 | 2.44 |
| 13400 | 134.540 | 0.254 | 1.647 | 0.011 | 2.93 |
| 13401 | 107.354 | 0.203 | 2.333 | 0.015 | 3.92 |
| 13402 | 39.071 | 0.074 | 1.225 | 0.008 | HIGH |
| 13403 | -153.073 | 0.289 | 4.654 | 0.030 | 2.44 |
| 13406 | 184.478 | 0.348 | 8.125 | 0.052 | 1.83 |
| 13407 | 215.750 | 0.407 | 2.261 | 0.014 | 1.45 |
| 13408 | 213.205 | 0.402 | 0.440 | 0.003 | 1.49 |
| 13409 | 216.844 | 0.409 | 1.268 | 0.008 | 1.44 |
| 13410 | 235.640 | 0.445 | 1.265 | 0.008 | 1.25 |
| 13411 | 283.382 | 0.535 | 1.113 | 0.007 | 0.87 |
| 13412 | 360.101 | 0.679 | 4.318 | 0.028 | 0.47 |
| 13413 | 234.735 | 0.443 | 6.663 | 0.043 | 1.24 |
| 13415 | 203.191 | 0.383 | 1.643 | 0.010 | 1.61 |
| 13416 | 234.215 | 0.442 | 0.202 | 0.001 | 1.26 |
| 13417 | 248.924 | 0.470 | 0.419 | 0.003 | 1.13 |
| 13418 | 277.719 | 0.524 | 0.490 | 0.003 | 0.91 |
| 13419 | 331.416 | 0.625 | 0.497 | 0.003 | 0.60 |
| 13420 | 423.921 | 0.800 | 1.462 | 0.009 | 0.25 |
| 13421 | 464.354 | 0.876 | 3.614 | 0.023 | 0.14 |
| 13424 | 213.571 | 0.403 | 1.578 | 0.010 | 1.48 |
| 13425 | 249.880 | 0.471 | 0.390 | 0.002 | 1.12 |
| 13426 | 273.365 | 0.516 | 0.281 | 0.002 | 0.94 |
| 13427 | 312.420 | 0.589 | 0.579 | 0.004 | 0.70 |
| 13428 | 368.601 | 0.695 | 0.953 | 0.006 | 0.44 |
| 13429 | 419.230 | 0.791 | 1.045 | 0.007 | 0.26 |
| 13430 | 467.307 | 0.882 | 7.458 | 0.048 | 0.13 |
| 13432 | 215.565 | 0.407 | 0.958 | 0.006 | 1.46 |
| 13433 | 250.617 | 0.473 | 0.900 | 0.006 | 1.11 |
| 13434 | 273.692 | 0.516 | 1.150 | 0.007 | 0.94 |
| 13435 | 306.207 | 0.578 | 1.271 | 0.008 | 0.73 |
| 13436 | 338.414 | 0.639 | 1.369 | 0.009 | 0.57 |
| 13437 | 377.325 | 0.712 | 3.663 | 0.023 | 0.40 |
| 13438 | 390.694 | 0.737 | 6.921 | 0.044 | 0.35 |
| 13440 | 200.294 | 0.378 | 1.134 | 0.007 | 1.64 |
| 13441 | 229.904 | 0.434 | 1.571 | 0.010 | 1.30 |
| 13442 | 246.240 | 0.465 | 1.684 | 0.011 | 1.15 |
| 13443 | 262.604 | 0.495 | 1.712 | 0.011 | 1.02 |
| 13444 | 277.289 | 0.523 | 1.179 | 0.008 | 0.91 |
| 13445 | 294.102 | 0.555 | 1.966 | 0.013 | 0.80 |
| 13446 | 305.750 | 0.577 | 4.136 | 0.026 | 0.73 |
| 13450 | 168.488 | 0.318 | 1.641 | 0.010 | 2.14 |
| 13451 | 191.424 | 0.361 | 2.054 | 0.013 | 1.76 |
| 13452 | 200.130 | 0.378 | 2.041 | 0.013 | 1.64 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: REGULAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13453 | 203.207 | 0.383 | 1.727 | 0.011 | 1.61 |
| 13454 | 204.002 | 0.385 | 0.902 | 0.006 | 1.60 |
| 13455 | 195.503 | 0.369 | 2.314 | 0.015 | 1.71 |
| 13456 | 183.544 | 0.346 | 2.581 | 0.016 | 1.88 |
| 13457 | 163.449 | 0.308 | 1.639 | 0.010 | 2.24 |
| 13459 | 129.945 | 0.245 | 2.274 | 0.015 | 3.07 |
| 13460 | 147.484 | 0.278 | 2.300 | 0.015 | 2.59 |
| 13461 | 149.907 | 0.283 | 2.297 | 0.015 | 2.53 |
| 13462 | 143.971 | 0.272 | 1.447 | 0.009 | 2.68 |
| 13463 | 128.775 | 0.243 | 1.151 | 0.007 | 3.11 |
| 13464 | 106.230 | 0.200 | 2.073 | 0.013 | 3.98 |
| 13465 | 70.918 | 0.134 | 2.176 | 0.014 | 6.44 |
| 13467 | 98.233 | 0.185 | 2.905 | 0.019 | 4.37 |
| 13468 | 109.754 | 0.207 | 2.721 | 0.017 | 3.81 |
| 13469 | 106.054 | 0.200 | 2.279 | 0.015 | 3.98 |
| 13470 | 89.996 | 0.170 | 1.215 | 0.008 | 4.88 |
| 13471 | 68.198 | 0.129 | 1.391 | 0.009 | 6.76 |
| 13472 | 37.829 | 0.071 | 2.130 | 0.014 | HIGH |
| 13473 | 24.384 | 0.046 | 2.295 | 0.015 | HIGH |
| 13474 | 79.047 | 0.149 | 3.653 | 0.023 | 5.64 |
| 13475 | 81.876 | 0.154 | 2.985 | 0.019 | 5.43 |
| 13476 | 69.218 | 0.131 | 2.112 | 0.013 | 6.63 |
| 13477 | 49.766 | 0.094 | 0.883 | 0.006 | 9.64 |
| 13478 | 27.393 | 0.052 | 1.882 | 0.012 | HIGH |
| 13479 | 25.791 | 0.049 | 3.663 | 0.023 | HIGH |
| 13480 | 62.628 | 0.118 | 4.169 | 0.027 | 7.34 |
| 13481 | 57.737 | 0.109 | 2.977 | 0.019 | 8.10 |
| 13482 | 40.980 | 0.077 | 1.845 | 0.012 | HIGH |
| 13483 | 22.228 | 0.042 | 1.330 | 0.008 | HIGH |
| 13484 | 25.055 | 0.047 | 4.033 | 0.026 | HIGH |
| 13485 | 50.275 | 0.095 | 3.838 | 0.025 | 9.38 |
| 13486 | 36.784 | 0.069 | 2.712 | 0.017 | HIGH |
| 13487 | 24.008 | 0.045 | 1.406 | 0.009 | HIGH |
| 13488 | 25.554 | 0.048 | 3.412 | 0.022 | HIGH |
| 13489 | 48.471 | 0.091 | 3.455 | 0.022 | 9.79 |
| 13490 | 28.386 | 0.054 | 2.360 | 0.015 | HIGH |
| 13491 | 36.521 | 0.069 | 2.979 | 0.019 | HIGH |
| 13492 | 131.209 | 0.248 | 2.089 | 0.013 | 3.03 |
| 13499 | 56.969 | 0.107 | 2.080 | 0.013 | 8.26 |
| 13500 | 10.993 | 0.021 | 0.196 | 0.001 | HIGH |
| 13501 | -22.519 | 0.042 | 0.368 | 0.002 | HIGH |
| 13502 | -45.833 | 0.086 | 0.390 | 0.002 | HIGH |
| 13503 | -65.727 | 0.124 | 0.553 | 0.004 | 7.06 |
| 13504 | -87.582 | 0.165 | 0.694 | 0.004 | 5.05 |
| 13505 | -103.156 | 0.195 | 2.680 | 0.017 | 4.12 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: RE4 VLAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13509 | 62.363 | 0.118 | 0.680 | 0.004 | 7.49 |
| 13510 | 21.380 | 0.040 | 0.689 | 0.004 | HIGH |
| 13511 | -9.150 | 0.017 | 0.859 | 0.005 | HIGH |
| 13512 | -31.693 | 0.060 | 0.981 | 0.006 | HIGH |
| 13513 | -50.623 | 0.096 | 1.050 | 0.007 | 9.45 |
| 13514 | -63.585 | 0.120 | 1.251 | 0.008 | 7.32 |
| 13515 | -85.589 | 0.161 | 1.558 | 0.010 | 5.18 |
| 13518 | 59.356 | 0.112 | 3.492 | 0.022 | 7.83 |
| 13519 | 37.433 | 0.071 | 0.932 | 0.006 | HIGH |
| 13520 | 14.741 | 0.028 | 1.323 | 0.008 | HIGH |
| 13521 | -7.214 | 0.014 | 1.507 | 0.010 | HIGH |
| 13522 | -26.832 | 0.051 | 1.622 | 0.010 | HIGH |
| 13523 | -43.764 | 0,083 | 1.638 | 0.010 | HIGH |
| 13524 | -57.780 | 0.109 | 1.681 | 0.011 | 8.14 |
| 13526 | 14.790 | 0.028 | 3.086 | 0.020 | HIGH |
| 13527 | 24.886 | 0.047 | 1.072 | 0.007 | HIGH |
| 13528 | 16.232 | 0.031 | 1.596 | 0.010 | HIGH |
| 13529 | 3.119 | 0.006 | 1.930 | 0.012 | HIGH |
| 13530 | -13.085 | 0.025 | 2.134 | 0.014 | HIGH |
| 13531 | -25.899 | 0.049 | 2.257 | 0.014 | HIGH |
| 13532 | -29.381 | 0.055 | 2.406 | 0.015 | HIGH |
| 13534 | -42.052 | 0.079 | 5.977 | 0.038 | HIGH |
| 13535 | -26.425 | 0.050 | 2.997 | 0.019 | HIGH |
| 13536 | -9.769 | 0.018 | 1.581 | 0.010 | HIGH |
| 13537 | -8.933 | 0.017 | 2.198 | 0.014 | HIGH |
| 13538 | -19.952 | 0.038 | 2.418 | 0.015 | HIGH |
| 13539 | -23.475 | 0.044 | 2.778 | 0.018 | HIGH |
| 13540 | -17.910 | 0.034 | 3.093 | 0.020 | HIGH |
| 13544 | -120.774 | 0.228 | 4.442 | 0.028 | 3.35 |
| 13545 | -103.053 | 0.194 | 0.946 | 0.006 | 4.14 |
| 13546 | -64.186 | 0.121 | 1.165 | 0.007 | 7.24 |
| 13547 | -49.606 | 0.094 | 2.129 | 0.014 | 9.62 |
| 13548 | -46.668 | 0.088 | 2.546 | 0.016 | HIGH |
| 13549 | -42.068 | 0.079 | 2.904 | 0.019 | HIGH |
| 13550 | -27.354 | 0.052 | 4.041 | 0.026 | HIGH |
| 13553 | -223.536 | 0.422 | 0.612 | 0.004 | 1.37 |
| 13554 | -191.889 | 0.362 | 0.744 | 0.005 | 1.76 |
| 13555 | -141.274 | 0.267 | 0.656 | 0.004 | 2.75 |
| 13556 | -109.210 | 0.206 | 1.928 | 0.012 | 3.84 |
| 13557 | -92.897 | 0.175 | 2.601 | 0.017 | 4.68 |
| 13558 | -84.292 | 0.159 | 2.857 | 0.018 | 5.25 |
| 13559 | -63.770 | 0.120 | 3.517 | 0.022 | 7.22 |
| 13561 | -412.126 | 0.778 | 2.230 | 0.014 | 0.29 |
| 13562 | -333.265 | 0.629 | 1.675 | 0.011 | 0.59 |
| 13563 | -240.810 | 0.454 | 0.860 | 0.005 | 1.20 |

S.S.119

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: [illegible]LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13564 | -184.726 | 0.349 | 1.778 | 0.011 | 1.87 |
| 13565 | -152.228 | 0.287 | 2.643 | 0.017 | 2.47 |
| 13566 | -136.020 | 0.257 | 2.821 | 0.018 | 2.88 |
| 13567 | -110.393 | 0.208 | 2.942 | 0.019 | 3.78 |
| 13568 | -278.973 | 0.526 | 6.296 | 0.040 | 0.89 |
| 13569 | -348.786 | 0.658 | 3.846 | 0.025 | 0.52 |
| 13570 | -301.069 | 0.568 | 2.005 | 0.013 | 0.76 |
| 13571 | -247.420 | 0.467 | 1.616 | 0.010 | 1.14 |
| 13572 | -208.417 | 0.393 | 2.751 | 0.018 | 1.54 |
| 13573 | -185.432 | 0.350 | 2.992 | 0.019 | 1.85 |
| 13574 | -153.637 | 0.290 | 3.117 | 0.020 | 2.44 |
| 13575 | -272.502 | 0.514 | 13.361 | 0.085 | 0.90 |
| 13576 | -293.968 | 0.555 | 5.000 | 0.032 | 0.80 |
| 13577 | -275.169 | 0.519 | 1.543 | 0.010 | 0.92 |
| 13578 | -246.410 | 0.465 | 2.691 | 0.017 | 1.15 |
| 13579 | -222.967 | 0.421 | 3.372 | 0.022 | 1.37 |
| 13580 | -186.593 | 0.352 | 3.486 | 0.022 | 1.83 |
| 13581 | -250.132 | 0.472 | 15.351 | 0.098 | 1.04 |
| 13582 | -260.517 | 0.492 | 4.613 | 0.029 | 1.03 |
| 13583 | -256.869 | 0.485 | 1.713 | 0.011 | 1.06 |
| 13584 | -242.182 | 0.457 | 3.771 | 0.024 | 1.18 |
| 13585 | -205.514 | 0.388 | 3.899 | 0.025 | 1.57 |
| 13586 | -209.459 | 0.395 | 12.272 | 0.078 | 1.46 |
| 13587 | -235.292 | 0.444 | 2.838 | 0.018 | 1.25 |
| 13588 | -237.831 | 0.449 | 4.040 | 0.026 | 1.22 |
| 13589 | -206.985 | 0.391 | 4.635 | 0.030 | 1.55 |
| 13590 | -153.146 | 0.289 | 3.599 | 0.023 | 2.44 |
| 13591 | -216.694 | 0.409 | 9.650 | 0.062 | 1.40 |
| 13592 | -185.460 | 0.350 | 8.345 | 0.053 | 1.81 |
| 13594 | -219.410 | 0.414 | 27.843 | 0.178 | 1.16 |
| 22201 | -17.631 | 0.033 | 2.211 | 0.014 | HIGH |
| 22202 | -101.773 | 0.192 | 1.610 | 0.010 | 4.20 |
| 22203 | -96.842 | 0.183 | 1.548 | 0.010 | 4.46 |
| 22204 | 67.167 | 0.127 | 1.322 | 0.008 | 6.88 |
| 22205 | 46.178 | 0.087 | 16.828 | 0.107 | 8.32 |
| 22206 | 13.615 | 0.026 | 15.445 | 0.099 | HIGH |
| 22207 | 177.713 | 0.335 | 32.927 | 0.210 | 1.50 |
| 22208 | -20.057 | 0.038 | 41.424 | 0.265 | 6.38 |
| 22215 | -25.104 | 0.047 | 1.897 | 0.012 | HIGH |
| 22216 | 17.193 | 0.032 | 1.264 | 0.008 | HIGH |
| 22222 | 138.470 | 0.261 | 43.558 | 0.278 | 1.72 |
| 22223 | 234.419 | 0.442 | 91.410 | 0.584 | 0.20 |
| 22224 | -20.089 | 0.038 | 2.703 | 0.017 | HIGH |
| 22225 | 12.753 | 0.024 | 1.452 | 0.009 | HIGH |
| 22226 | 25.530 | 0.048 | 0.965 | 0.006 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: REGULAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22227 | 30.130 | 0.057 | 3.019 | 0.019 | HIGH |
| 22228 | 29.908 | 0.056 | 6.911 | 0.044 | HIGH |
| 22229 | 30.347 | 0.057 | 13.928 | 0.089 | HIGH |
| 22230 | 51.813 | 0.098 | 16.708 | 0.107 | 7.50 |
| 22231 | 93.778 | 0.177 | 69.228 | 0.442 | 1.40 |
| 22232 | 174.053 | 0.328 | 97.758 | 0.624 | 0.30 |
| 22233 | 138.682 | 0.262 | 168.458 | 1.076 | -0.28 |
| 22234 | -44.187 | 0.083 | 3.556 | 0.023 | HIGH |
| 22235 | -0.574 | 0.001 | 1.373 | 0.009 | HIGH |
| 22236 | 18.344 | 0.035 | 1.073 | 0.007 | HIGH |
| 22237 | 24.760 | 0.047 | 3.178 | 0.020 | HIGH |
| 22238 | 25.813 | 0.049 | 8.704 | 0.056 | HIGH |
| 22239 | 30.045 | 0.057 | 16.659 | 0.106 | HIGH |
| 22240 | 46.843 | 0.088 | 18.391 | 0.117 | 7.93 |
| 22241 | 73.431 | 0.139 | 26.969 | 0.172 | 4.42 |
| 22242 | 109.984 | 0.208 | 273.116 | 1.744 | -0.65 |
| 22243 | 20.099 | 0.038 | 2.439 | 0.016 | HIGH |
| 22244 | 119.970 | 0.226 | 458.524 | 2.928 | -0.85 |
| 22245 | -40.722 | 0.077 | 2.167 | 0.014 | HIGH |
| 22246 | -63.980 | 0.121 | 1.069 | 0.007 | 7.27 |
| 22247 | 23.870 | 0.045 | 1.267 | 0.008 | HIGH |
| 22248 | 19.670 | 0.037 | 1.449 | 0.009 | HIGH |
| 22249 | 16.453 | 0.031 | 4.903 | 0.031 | HIGH |
| 22250 | 18.873 | 0.036 | 12.337 | 0.079 | HIGH |
| 22251 | 36.617 | 0.069 | 16.171 | 0.103 | HIGH |
| 22252 | 55.253 | 0.104 | 18.449 | 0.118 | 6.82 |
| 22253 | 80.994 | 0.153 | 62.374 | 0.398 | 1.84 |
| 22254 | 90.402 | 0.171 | 168.238 | 1.074 | -0.23 |
| 22255 | -29.635 | 0.056 | 282.828 | 1.806 | -0.65 |
| 22256 | 29.733 | 0.056 | 49.196 | 0.314 | 4.32 |
| 22257 | -60.388 | 0.114 | 3.929 | 0.025 | 7.66 |
| 22258 | -21.504 | 0.041 | 1.279 | 0.008 | HIGH |
| 22259 | -46.627 | 0.088 | 1.663 | 0.011 | HIGH |
| 22260 | 9.426 | 0.018 | 1.650 | 0.011 | HIGH |
| 22261 | -0.453 | 0.001 | 2.071 | 0.013 | HIGH |
| 22262 | -6.202 | 0.012 | 2.384 | 0.015 | HIGH |
| 22263 | 27.570 | 0.052 | 7.501 | 0.048 | HIGH |
| 22264 | 31.161 | 0.059 | 7.605 | 0.049 | HIGH |
| 22265 | 38.071 | 0.072 | 7.837 | 0.050 | HIGH |
| 22266 | 31.981 | 0.060 | 52.065 | 0.332 | 3.86 |
| 22267 | 17.958 | 0.034 | 86.210 | 0.551 | 1.59 |
| 22268 | 30.321 | 0.057 | 70.855 | 0.452 | 2.26 |
| 22269 | 47.724 | 0.090 | 17.073 | 0.109 | 8.03 |
| 22270 | 113.741 | 0.215 | 2.981 | 0.019 | 3.64 |
| 22271 | 84.898 | 0.160 | 1.412 | 0.009 | 5.23 |

S.S. 180

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: 250 LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22272 | 87.822 | 0.166 | 1.729 | 0.011 | 5.02 |
| 22273 | 53.563 | 0.101 | 1.339 | 0.009 | 8.87 |
| 22274 | 35.838 | 0.068 | 0.764 | 0.005 | HIGH |
| 22275 | -43.778 | 0.083 | 0.224 | 0.001 | HIGH |
| 22278 | 89.934 | 0.170 | 7.394 | 0.047 | 4.73 |
| 22279 | 149.368 | 0.282 | 1.867 | 0.012 | 2.54 |
| 22280 | 86.390 | 0.164 | 1.825 | 0.012 | 5.10 |
| 22281 | 68.113 | 0.129 | 1.295 | 0.008 | 6.77 |
| 22282 | 59.569 | 0.112 | 1.216 | 0.008 | 7.88 |
| 22283 | -25.750 | 0.049 | 3.421 | 0.022 | HIGH |
| 22286 | 140.303 | 0.265 | 2.349 | 0.015 | 2.77 |
| 22287 | 92.318 | 0.174 | 2.077 | 0.013 | 4.72 |
| 22288 | 96.765 | 0.183 | 1.303 | 0.008 | 4.47 |
| 22289 | 90.720 | 0.171 | 1.417 | 0.009 | 4.83 |
| 22290 | 86.531 | 0.163 | 1.564 | 0.010 | 5.11 |
| 22293 | 103.560 | 0.195 | 7.951 | 0.051 | 3.98 |
| 22294 | 114.926 | 0.217 | 1.046 | 0.007 | 3.61 |
| 22295 | 118.530 | 0.224 | 2.068 | 0.013 | 3.46 |
| 22296 | 117.872 | 0.222 | 2.934 | 0.019 | 3.48 |
| 22297 | 127.072 | 0.240 | 2.965 | 0.019 | 3.15 |
| 22300 | 136.578 | 0.258 | 1.132 | 0.007 | 2.88 |
| 22301 | 143.630 | 0.271 | 0.628 | 0.004 | 2.69 |
| 22302 | 141.685 | 0.267 | 5.434 | 0.035 | 2.70 |
| 22303 | 137.831 | 0.260 | 8.872 | 0.057 | 2.75 |
| 22304 | 137.900 | 0.260 | 9.512 | 0.061 | 2.74 |
| 22308 | 146.794 | 0.277 | 4.201 | 0.027 | 2.59 |
| 22309 | 172.204 | 0.325 | 9.642 | 0.062 | 2.01 |
| 22310 | 154.819 | 0.292 | 15.114 | 0.097 | 2.24 |
| 22311 | 138.328 | 0.261 | 20.137 | 0.129 | 2.46 |
| 22312 | 111.479 | 0.210 | 24.987 | 0.160 | 2.99 |
| 22316 | 168.229 | 0.317 | 19.365 | 0.124 | 1.91 |
| 22317 | 166.441 | 0.314 | 18.970 | 0.121 | 1.95 |
| 22318 | 148.196 | 0.280 | 34.637 | 0.221 | 1.85 |
| 22319 | 121.958 | 0.230 | 38.039 | 0.243 | 2.18 |
| 22320 | 85.761 | 0.162 | 35.906 | 0.229 | 3.21 |
| 22323 | 170.515 | 0.322 | 34.778 | 0.222 | 1.54 |
| 22324 | 165.560 | 0.312 | 30.854 | 0.197 | 1.70 |
| 22325 | 140.395 | 0.265 | 75.784 | 0.484 | 0.83 |
| 22326 | 104.414 | 0.197 | 98.647 | 0.630 | 0.56 |
| 22327 | 36.377 | 0.069 | 35.423 | 0.226 | 6.00 |
| 22329 | 172.196 | 0.325 | 78.388 | 0.501 | 0.61 |
| 22330 | 181.017 | 0.342 | 74.744 | 0.477 | 0.62 |
| 22331 | 172.379 | 0.325 | 161.704 | 1.033 | -0.28 |
| 22332 | 86.031 | 0.162 | 185.535 | 1.185 | -0.34 |
| 22333 | 74.293 | 0.140 | 46.796 | 0.299 | 2.83 |

S.S. 121

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: EQUILAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22334 | 163.183 | 0.308 | 116.442 | 0.744 | 0.11 |
| 22335 | 180.407 | 0.340 | 290.120 | 1.853 | -0.70 |
| 22336 | 29.655 | 0.056 | 0.273 | 0.002 | HIGH |
| 22337 | 194.857 | 0.368 | 366.767 | 2.342 | -0.79 |
| 22338 | 114.480 | 0.216 | 87.209 | 0.557 | 0.74 |
| 22339 | 103.056 | 0.194 | 205.071 | 1.310 | -0.44 |
| 22340 | 163.790 | 0.309 | 32.873 | 0.210 | 1.67 |
| 22341 | 91.786 | 0.173 | 35.224 | 0.225 | 3.05 |
| 22342 | 82.216 | 0.155 | 44.544 | 0.284 | 2.76 |
| 22343 | 61.187 | 0.115 | 26.328 | 0.168 | 5.27 |
| 22346 | -52.113 | 0.098 | 48.477 | 0.310 | 3.41 |
| 22347 | -56.884 | 0.107 | 171.590 | 1.096 | -0.22 |
| 22348 | -20.594 | 0.039 | 63.322 | 0.404 | 3.10 |
| 22349 | -24.098 | 0.045 | 127.569 | 0.815 | 0.34 |
| 22350 | -68.557 | 0.129 | 77.665 | 0.496 | 1.37 |
| 22351 | -79.089 | 0.149 | 20.403 | 0.130 | 4.63 |
| 22353 | 34.997 | 0.066 | 105.544 | 0.674 | 0.76 |
| 22354 | -17.069 | 0.032 | 34.359 | 0.219 | 8.75 |
| 22355 | -99.768 | 0.188 | 141.977 | 0.907 | -0.03 |
| 22356 | -16.333 | 0.031 | 0.276 | 0.002 | HIGH |
| 22357 | -82.112 | 0.155 | 144.110 | 0.920 | -0.02 |
| 22358 | -95.041 | 0.179 | 73.002 | 0.466 | 1.26 |
| 22361 | -29.337 | 0.055 | 62.706 | 0.400 | 2.89 |
| 22362 | -71.429 | 0.135 | 49.993 | 0.319 | 2.70 |
| 22363 | -107.627 | 0.203 | 72.602 | 0.464 | 1.16 |
| 22364 | -116.658 | 0.220 | 60.083 | 0.384 | 1.46 |
| 22365 | -102.550 | 0.193 | 101.926 | 0.651 | 0.50 |
| 22368 | -78.598 | 0.148 | 31.982 | 0.204 | 3.75 |
| 22369 | -93.932 | 0.177 | 20.180 | 0.129 | 3.88 |
| 22370 | -120.040 | 0.226 | 51.313 | 0.328 | 1.71 |
| 22371 | -145.468 | 0.274 | 52.816 | 0.337 | 1.36 |
| 22372 | -138.827 | 0.262 | 103.054 | 0.658 | 0.35 |
| 22375 | -121.211 | 0.229 | 13.025 | 0.083 | 3.14 |
| 22376 | -121.318 | 0.229 | 12.369 | 0.079 | 3.16 |
| 22377 | -137.697 | 0.260 | 25.657 | 0.164 | 2.31 |
| 22378 | -156.011 | 0.294 | 27.849 | 0.178 | 1.91 |
| 22379 | -162.476 | 0.307 | 57.889 | 0.370 | 1.08 |
| 22383 | -140.165 | 0.264 | 4.045 | 0.026 | 2.76 |
| 22384 | -143.924 | 0.272 | 4.256 | 0.027 | 2.66 |
| 22385 | -147.886 | 0.279 | 10.630 | 0.068 | 2.47 |
| 22386 | -165.329 | 0.312 | 11.384 | 0.073 | 2.10 |
| 22387 | -168.132 | 0.317 | 23.980 | 0.153 | 1.82 |
| 22390 | -149.079 | 0.281 | 1.030 | 0.007 | 2.55 |
| 22391 | -155.628 | 0.294 | 0.660 | 0.004 | 2.40 |
| 22392 | -156.481 | 0.295 | 4.018 | 0.026 | 2.37 |

S.S.122

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: REGULAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22393 | -158.778 | 0.300 | 5.037 | 0.032 | 2.31 |
| 22394 | -166.247 | 0.314 | 9.821 | 0.063 | 2.11 |
| 22396 | -138.338 | 0.261 | 0.947 | 0.006 | 2.83 |
| 22397 | -153.932 | 0.290 | 0.914 | 0.006 | 2.44 |
| 22398 | -160.135 | 0.302 | 2.126 | 0.014 | 2.30 |
| 22399 | -156.832 | 0.296 | 2.269 | 0.014 | 2.37 |
| 22400 | -149.413 | 0.282 | 4.268 | 0.027 | 2.52 |
| 22401 | -115.315 | 0.218 | 1.125 | 0.007 | 3.59 |
| 22402 | -141.153 | 0.266 | 1.373 | 0.009 | 2.75 |
| 22403 | -159.727 | 0.301 | 1.625 | 0.010 | 2.31 |
| 22404 | -155.426 | 0.293 | 2.664 | 0.017 | 2.40 |
| 22405 | -143.937 | 0.272 | 3.402 | 0.022 | 2.67 |
| 22406 | -124.910 | 0.236 | 2.448 | 0.016 | 3.23 |
| 22407 | -161.618 | 0.305 | 2.145 | 0.014 | 2.27 |
| 22408 | -151.535 | 0.286 | 2.358 | 0.015 | 2.49 |
| 22409 | -149.533 | 0.282 | 6.690 | 0.043 | 2.49 |
| 22410 | -93.424 | 0.176 | 5.710 | 0.036 | 4.58 |
| 22411 | -90.306 | 0.170 | 1.798 | 0.011 | 4.86 |
| 22412 | -191.929 | 0.362 | 7.453 | 0.048 | 1.72 |
| 22413 | -85.719 | 0.162 | 2.686 | 0.017 | 5.15 |
| 22414 | -114.657 | 0.216 | 2.149 | 0.014 | 3.61 |
| 22415 | -67.904 | 0.128 | 2.865 | 0.018 | 6.75 |
| 23301 | -56.864 | 0.107 | 2.369 | 0.015 | 8.26 |
| 23302 | 102.207 | 0.193 | 2.164 | 0.014 | 4.17 |
| 23303 | 78.004 | 0.147 | 2.309 | 0.015 | 5.77 |
| 23304 | -116.516 | 0.220 | 1.617 | 0.010 | 3.54 |
| 23305 | -91.953 | 0.173 | 1.621 | 0.010 | 4.75 |
| 23306 | -23.177 | 0.044 | 1.651 | 0.011 | HIGH |
| 23307 | -166.577 | 0.314 | 2.254 | 0.014 | 2.18 |
| 23308 | -10.835 | 0.020 | 1.229 | 0.008 | HIGH |
| 23313 | -42.935 | 0.081 | 0.021 | 0.000 | HIGH |
| 23314 | -81.553 | 0.154 | 0.220 | 0.001 | 5.50 |
| 23319 | -124.675 | 0.235 | 1.376 | 0.009 | 3.25 |
| 23320 | -125.879 | 0.238 | 1.165 | 0.007 | 3.21 |
| 23321 | -78.739 | 0.149 | 1.360 | 0.009 | 5.72 |
| 23322 | -75.430 | 0.142 | 0.489 | 0.003 | 6.02 |
| 23323 | -70.090 | 0.132 | 1.629 | 0.010 | 6.54 |
| 23324 | -10.213 | 0.019 | 2.711 | 0.017 | HIGH |
| 23327 | -92.480 | 0.174 | 2.384 | 0.015 | 4.71 |
| 23328 | -34.444 | 0.065 | 1.107 | 0.007 | HIGH |
| 23329 | -116.314 | 0.219 | 1.001 | 0.006 | 3.55 |
| 23330 | -133.519 | 0.252 | 1.346 | 0.009 | 2.97 |
| 23331 | -74.119 | 0.140 | 1.525 | 0.010 | 6.14 |
| 23332 | -54.541 | 0.103 | 1.141 | 0.007 | 8.70 |
| 23333 | -95.131 | 0.179 | 0.899 | 0.006 | 4.57 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: REGULAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23334 | -63.881 | 0.121 | 6.610 | 0.042 | 7.03 |
| 23338 | -117.662 | 0.222 | 4.706 | 0.030 | 3.46 |
| 23339 | -78.864 | 0.149 | 1.557 | 0.010 | 5.71 |
| 23340 | -125.975 | 0.238 | 1.076 | 0.007 | 3.20 |
| 23341 | -120.116 | 0.227 | 0.783 | 0.005 | 3.41 |
| 23342 | -67.011 | 0.126 | 1.346 | 0.009 | 6.89 |
| 23343 | -34.206 | 0.065 | 1.440 | 0.009 | HIGH |
| 23344 | -47.376 | 0.089 | 1.211 | 0.008 | HIGH |
| 23345 | -104.727 | 0.198 | 3.912 | 0.025 | 4.02 |
| 23350 | -65.881 | 0.124 | 5.621 | 0.036 | 6.86 |
| 23351 | -97.145 | 0.183 | 2.538 | 0.016 | 4.43 |
| 23352 | -116.299 | 0.219 | 0.401 | 0.003 | 3.56 |
| 23353 | -102.890 | 0.194 | 0.562 | 0.004 | 4.15 |
| 23354 | -65.589 | 0.124 | 0.997 | 0.006 | 7.07 |
| 23355 | -30.312 | 0.057 | 1.378 | 0.009 | HIGH |
| 23356 | -30.444 | 0.057 | 1.498 | 0.010 | HIGH |
| 23357 | -24.394 | 0.046 | 2.355 | 0.015 | HIGH |
| 23363 | -62.503 | 0.118 | 6.076 | 0.039 | 7.24 |
| 23364 | -78.278 | 0.148 | 0.829 | 0.005 | 5.77 |
| 23365 | -97.843 | 0.185 | 0.582 | 0.004 | 4.42 |
| 23366 | -85.214 | 0.161 | 0.981 | 0.006 | 5.21 |
| 23367 | -59.232 | 0.112 | 3.727 | 0.024 | 7.83 |
| 23368 | -33.879 | 0.064 | 0.479 | 0.003 | HIGH |
| 23369 | -22.973 | 0.043 | 1.861 | 0.012 | HIGH |
| 23370 | -10.759 | 0.020 | 2.125 | 0.014 | HIGH |
| 23371 | 46.650 | 0.088 | 2.986 | 0.019 | HIGH |
| 23376 | -52.699 | 0.099 | 7.700 | 0.049 | 8.56 |
| 23377 | -42.147 | 0.080 | 1.046 | 0.007 | HIGH |
| 23378 | -60.160 | 0.114 | 0.669 | 0.004 | 7.80 |
| 23379 | -81.912 | 0.155 | 0.653 | 0.004 | 5.47 |
| 23380 | -70.992 | 0.134 | 1.481 | 0.009 | 6.45 |
| 23382 | 30.789 | 0.058 | 0.949 | 0.006 | HIGH |
| 23383 | 11.005 | 0.021 | 0.536 | 0.003 | HIGH |
| 23384 | 14.534 | 0.027 | 2.147 | 0.014 | HIGH |
| 23385 | 31.926 | 0.060 | 2.668 | 0.017 | HIGH |
| 23386 | -2.011 | 0.004 | 2.056 | 0.013 | HIGH |
| 23390 | 2.577 | 0.005 | 5.756 | 0.037 | HIGH |
| 23391 | -20.381 | 0.038 | 0.709 | 0.005 | HIGH |
| 23392 | -29.339 | 0.055 | 0.516 | 0.003 | HIGH |
| 23393 | -46.250 | 0.087 | 0.269 | 0.002 | HIGH |
| 23394 | -68.698 | 0.130 | 0.383 | 0.002 | 6.71 |
| 23395 | -61.721 | 0.116 | 1.501 | 0.010 | 7.57 |
| 23397 | -174.934 | 0.330 | 3.187 | 0.020 | 2.02 |
| 23398 | -157.423 | 0.297 | 1.215 | 0.008 | 2.36 |
| 23399 | -139.144 | 0.263 | 0.535 | 0.003 | 2.81 |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: REGULAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23400 | -117.906 | 0.222 | 0.772 | 0.005 | 3.49 |
| 23401 | -86.091 | 0.162 | 1.172 | 0.007 | 5.15 |
| 23402 | -43.857 | 0.083 | 1.366 | 0.009 | HIGH |
| 23403 | 28.077 | 0.053 | 5.256 | 0.034 | HIGH |
| 23406 | -150.041 | 0.283 | 3.391 | 0.022 | 2.52 |
| 23407 | -148.555 | 0.280 | 2.245 | 0.014 | 2.56 |
| 23408 | -159.148 | 0.300 | 2.093 | 0.013 | 2.32 |
| 23409 | -158.769 | 0.300 | 0.851 | 0.005 | 2.34 |
| 23410 | -145.434 | 0.274 | 1.932 | 0.012 | 2.64 |
| 23411 | -104.832 | 0.198 | 2.095 | 0.013 | 4.04 |
| 23412 | -94.109 | 0.178 | 2.292 | 0.015 | 4.61 |
| 23413 | -37.973 | 0.072 | 8.142 | 0.052 | HIGH |
| 23415 | -159.801 | 0.302 | 5.029 | 0.032 | 2.29 |
| 23416 | -181.312 | 0.342 | 4.274 | 0.027 | 1.91 |
| 23417 | -193.211 | 0.365 | 2.544 | 0.016 | 1.74 |
| 23418 | -198.947 | 0.375 | 1.685 | 0.011 | 1.66 |
| 23419 | -141.584 | 0.267 | 2.502 | 0.016 | 2.73 |
| 23420 | -70.656 | 0.133 | 4.090 | 0.026 | 6.41 |
| 23421 | -74.050 | 0.140 | 1.133 | 0.007 | 6.15 |
| 23424 | -202.992 | 0.383 | 8.485 | 0.054 | 1.57 |
| 23425 | -239.316 | 0.452 | 7.275 | 0.046 | 1.19 |
| 23426 | -286.079 | 0.559 | 2.366 | 0.015 | 0.79 |
| 23432 | -210.457 | 0.397 | 18.685 | 0.119 | 1.37 |
| 23433 | -234.325 | 0.442 | 7.056 | 0.045 | 1.24 |
| 23440 | -137.609 | 0.260 | 20.178 | 0.129 | 2.48 |
| 23450 | -31.687 | 0.060 | 30.771 | 0.196 | 7.49 |
| 23455 | -121.012 | 0.228 | 5.875 | 0.038 | 3.32 |
| 23456 | -134.958 | 0.255 | 3.796 | 0.024 | 2.90 |
| 23457 | -181.769 | 0.343 | 9.593 | 0.061 | 1.85 |
| 23463 | -114.361 | 0.216 | 2.954 | 0.019 | 3.61 |
| 23464 | -114.335 | 0.216 | 2.599 | 0.017 | 3.62 |
| 23465 | -39.105 | 0.074 | 1.532 | 0.010 | HIGH |
| 23467 | -45.238 | 0.085 | 14.659 | 0.094 | 8.88 |
| 23470 | -133.379 | 0.252 | 2.989 | 0.019 | 2.96 |
| 23471 | -102.051 | 0.193 | 2.953 | 0.019 | 4.17 |
| 23472 | -54.869 | 0.104 | 0.933 | 0.006 | 8.65 |
| 23473 | -44.773 | 0.084 | 0.972 | 0.006 | HIGH |
| 23474 | -69.807 | 0.132 | 11.139 | 0.071 | 6.07 |
| 23475 | -84.123 | 0.159 | 2.737 | 0.017 | 5.27 |
| 23476 | -94.309 | 0.178 | 2.413 | 0.015 | 4.60 |
| 23477 | -78.302 | 0.148 | 2.372 | 0.015 | 5.74 |
| 23478 | -58.926 | 0.111 | 1.584 | 0.010 | 7.97 |
| 23479 | -66.549 | 0.126 | 1.101 | 0.007 | 6.95 |
| 23480 | -93.814 | 0.177 | 7.703 | 0.049 | 4.49 |
| 23481 | -95.927 | 0.181 | 2.047 | 0.013 | 4.51 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: [redacted] LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23482 | -77.657 | 0.147 | 2.127 | 0.014 | 5.80 |
| 23483 | -57.855 | 0.109 | 2.075 | 0.013 | 8.12 |
| 23484 | -71.421 | 0.135 | 1.157 | 0.007 | 6.41 |
| 23485 | -92.123 | 0.174 | 5.201 | 0.033 | 4.67 |
| 23486 | -86.148 | 0.163 | 1.613 | 0.010 | 5.14 |
| 23487 | -64.151 | 0.121 | 1.851 | 0.012 | 7.23 |
| 23488 | -74.868 | 0.141 | 1.893 | 0.012 | 6.06 |
| 23489 | -83.521 | 0.158 | 2.993 | 0.019 | 5.31 |
| 23490 | -72.768 | 0.137 | 1.697 | 0.011 | 6.26 |
| 23491 | -80.100 | 0.151 | 2.526 | 0.016 | 5.58 |
| 23492 | -69.073 | 0.130 | 0.921 | 0.006 | 6.67 |
| 23493 | -83.671 | 0.158 | 3.886 | 0.025 | 5.27 |
| 23494 | -73.879 | 0.139 | 4.251 | 0.027 | 6.08 |
| 23499 | -48.420 | 0.091 | 2.148 | 0.014 | 9.88 |
| 23500 | -24.358 | 0.046 | 0.981 | 0.006 | HIGH |
| 23501 | 14.735 | 0.028 | 0.881 | 0.006 | HIGH |
| 23502 | 38.193 | 0.072 | 0.619 | 0.004 | HIGH |
| 23503 | 55.166 | 0.104 | 0.271 | 0.002 | 8.61 |
| 23504 | 73.531 | 0.139 | 0.505 | 0.003 | 6.21 |
| 23505 | 94.398 | 0.178 | 0.691 | 0.004 | 4.61 |
| 23506 | 109.684 | 0.207 | 1.582 | 0.010 | 3.82 |
| 23509 | -102.742 | 0.194 | 2.662 | 0.017 | 4.14 |
| 23510 | -21.643 | 0.041 | 1.616 | 0.010 | HIGH |
| 23511 | 25.513 | 0.048 | 1.613 | 0.010 | HIGH |
| 23512 | 44.859 | 0.085 | 1.331 | 0.009 | HIGH |
| 23513 | 64.626 | 0.122 | 1.140 | 0.007 | 7.19 |
| 23514 | 86.579 | 0.163 | 1.556 | 0.010 | 5.11 |
| 23515 | 97.951 | 0.185 | 1.642 | 0.010 | 4.40 |
| 23518 | -41.307 | 0.078 | 0.453 | 0.003 | HIGH |
| 23519 | -3.420 | 0.006 | 2.228 | 0.014 | HIGH |
| 23520 | 14.177 | 0.027 | 1.960 | 0.013 | HIGH |
| 23521 | 45.580 | 0.086 | 1.940 | 0.012 | HIGH |
| 23522 | 61.600 | 0.116 | 1.907 | 0.012 | 7.57 |
| 23523 | 79.841 | 0.151 | 3.114 | 0.020 | 5.59 |
| 23524 | 85.466 | 0.161 | 3.245 | 0.021 | 5.16 |
| 23530 | 99.197 | 0.187 | 3.417 | 0.022 | 4.31 |
| 23531 | 89.049 | 0.168 | 4.394 | 0.028 | 4.88 |
| 23532 | 86.574 | 0.163 | 5.520 | 0.035 | 5.02 |
| 23539 | 90.645 | 0.171 | 8.289 | 0.053 | 4.65 |
| 23540 | 87.719 | 0.166 | 10.147 | 0.065 | 4.75 |
| 23550 | 82.756 | 0.156 | 20.692 | 0.132 | 4.40 |
| 23553 | 96.056 | 0.181 | 4.305 | 0.027 | 4.46 |
| 23554 | 81.731 | 0.154 | 8.240 | 0.053 | 5.25 |
| 23559 | 49.924 | 0.094 | 22.658 | 0.145 | 6.80 |
| 23561 | 161.040 | 0.304 | 2.450 | 0.016 | 2.28 |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: [illegible] LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23562 | 169.087 | 0.319 | 3.167 | 0.020 | 2.12 |
| 23563 | 208.163 | 0.393 | 4.089 | 0.026 | 1.54 |
| 23568 | 156.545 | 0.295 | 1.267 | 0.008 | 2.38 |
| 23569 | 181.606 | 0.343 | 0.917 | 0.006 | 1.92 |
| 23570 | 222.342 | 0.420 | 2.482 | 0.016 | 1.38 |
| 23571 | 279.536 | 0.527 | 2.507 | 0.016 | 0.89 |
| 23574 | 27.993 | 0.053 | 10.189 | 0.065 | HIGH |
| 23575 | 177.216 | 0.334 | 1.400 | 0.009 | 1.99 |
| 23576 | 185.151 | 0.349 | 1.383 | 0.009 | 1.86 |
| 23577 | 198.620 | 0.375 | 1.452 | 0.009 | 1.67 |
| 23578 | 192.943 | 0.364 | 1.166 | 0.007 | 1.75 |
| 23579 | 136.217 | 0.257 | 3.691 | 0.024 | 2.87 |
| 23580 | 79.025 | 0.149 | 9.916 | 0.063 | 5.37 |
| 23581 | 182.197 | 0.344 | 0.773 | 0.005 | 1.91 |
| 23582 | 177.512 | 0.335 | 1.043 | 0.007 | 1.98 |
| 23583 | 178.021 | 0.336 | 1.167 | 0.007 | 1.98 |
| 23584 | 166.260 | 0.314 | 4.713 | 0.030 | 2.17 |
| 23585 | 126.479 | 0.239 | 16.870 | 0.108 | 2.86 |
| 23586 | 175.363 | 0.331 | 0.288 | 0.002 | 2.02 |
| 23587 | 167.740 | 0.316 | 0.304 | 0.002 | 2.16 |
| 23588 | 157.289 | 0.297 | 3.099 | 0.020 | 2.36 |
| 23589 | 134.735 | 0.254 | 15.228 | 0.097 | 2.69 |
| 23590 | 142.269 | 0.268 | 0.700 | 0.004 | 2.72 |
| 23591 | 140.141 | 0.264 | 1.182 | 0.008 | 2.78 |
| 23592 | 141.398 | 0.267 | 5.191 | 0.033 | 2.71 |
| 23594 | 187.764 | 0.354 | 1.895 | 0.012 | 1.82 |
| 32201 | -107.337 | 0.203 | 24.852 | 0.159 | 3.13 |
| 32202 | 192.480 | 0.363 | 33.081 | 0.211 | 1.33 |
| 32204 | -18.170 | 0.034 | 17.768 | 0.113 | HIGH |
| 32205 | 2.986 | 0.006 | 0.104 | 0.001 | HIGH |
| 32206 | -4.373 | 0.008 | 0.158 | 0.001 | HIGH |
| 32207 | -17.335 | 0.033 | 2.564 | 0.016 | HIGH |
| 32208 | -10.070 | 0.019 | 1.241 | 0.008 | HIGH |
| 32215 | -143.836 | 0.271 | 40.272 | 0.257 | 1.75 |
| 32216 | -59.941 | 0.113 | 80.962 | 0.517 | 1.33 |
| 32222 | -9.263 | 0.017 | 2.112 | 0.013 | HIGH |
| 32223 | -19.168 | 0.036 | 10.098 | 0.064 | HIGH |
| 32224 | -27.189 | 0.051 | 21.830 | 0.139 | HIGH |
| 32225 | 46.879 | 0.088 | 76.491 | 0.488 | 1.67 |
| 32226 | -52.488 | 0.099 | 20.432 | 0.130 | 6.85 |
| 32227 | -118.175 | 0.223 | 75.355 | 0.481 | 1.00 |
| 32228 | -78.226 | 0.148 | 28.763 | 0.184 | 4.02 |
| 32229 | -34.435 | 0.065 | 16.477 | 0.105 | HIGH |
| 32230 | -17.188 | 0.032 | 0.763 | 0.005 | HIGH |
| 32231 | -16.198 | 0.031 | 0.244 | 0.002 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: REGULAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32232 | -24.074 | 0.045 | 0.753 | 0.005 | HIGH |
| 32233 | -29.677 | 0.056 | 4.871 | 0.031 | HIGH |
| 32234 | -18.718 | 0.035 | 19.544 | 0.125 | HIGH |
| 32235 | 144.043 | 0.272 | 89.344 | 0.571 | 0.55 |
| 32236 | -21.364 | 0.040 | 54.074 | 0.345 | 4.11 |
| 32237 | 1.060 | 0.002 | 36.665 | 0.234 | HIGH |
| 32238 | -91.852 | 0.173 | 30.149 | 0.193 | 3.36 |
| 32239 | -62.138 | 0.117 | 6.725 | 0.043 | 7.24 |
| 32240 | -38.160 | 0.072 | 8.307 | 0.053 | HIGH |
| 32241 | -30.898 | 0.058 | 2.768 | 0.018 | HIGH |
| 32242 | -29.454 | 0.056 | 0.302 | 0.002 | HIGH |
| 32243 | -28.534 | 0.054 | 1.298 | 0.008 | HIGH |
| 32244 | -32.599 | 0.062 | 9.371 | 0.060 | HIGH |
| 32245 | 110.143 | 0.208 | 10.990 | 0.070 | 3.60 |
| 32246 | 120.166 | 0.227 | 45.386 | 0.290 | 1.93 |
| 32247 | -41.384 | 0.078 | 86.126 | 0.550 | 1.33 |
| 32248 | -21.872 | 0.041 | 75.338 | 0.481 | 2.13 |
| 32249 | -38.763 | 0.073 | 8.673 | 0.055 | HIGH |
| 32250 | -47.181 | 0.089 | 7.365 | 0.047 | 9.66 |
| 32251 | -38.835 | 0.073 | 4.473 | 0.029 | HIGH |
| 32252 | -33.090 | 0.062 | 3.979 | 0.025 | HIGH |
| 32253 | -32.518 | 0.061 | 0.828 | 0.005 | HIGH |
| 32254 | -31.132 | 0.059 | 1.083 | 0.007 | HIGH |
| 32255 | -25.410 | 0.048 | 1.477 | 0.009 | HIGH |
| 32256 | -32.731 | 0.062 | 1.070 | 0.007 | HIGH |
| 32257 | 101.171 | 0.191 | 14.463 | 0.092 | 3.85 |
| 32258 | 101.914 | 0.192 | 17.267 | 0.110 | 3.69 |
| 32259 | 121.486 | 0.229 | 47.115 | 0.301 | 1.85 |
| 32260 | 3.045 | 0.006 | 28.446 | 0.182 | HIGH |
| 32261 | -3.724 | 0.007 | 24.181 | 0.154 | HIGH |
| 32262 | -15.026 | 0.028 | 2.544 | 0.016 | HIGH |
| 32263 | -20.198 | 0.038 | 1.606 | 0.010 | HIGH |
| 32264 | -19.924 | 0.038 | 1.908 | 0.012 | HIGH |
| 32265 | -24.848 | 0.047 | 0.788 | 0.005 | HIGH |
| 32266 | -24.615 | 0.046 | 0.488 | 0.003 | HIGH |
| 32267 | -21.926 | 0.041 | 0.664 | 0.004 | HIGH |
| 32268 | -26.230 | 0.049 | 0.570 | 0.004 | HIGH |
| 32269 | -42.352 | 0.080 | 1.720 | 0.011 | HIGH |
| 32270 | -1.488 | 0.003 | 20.426 | 0.130 | HIGH |
| 32271 | -3.531 | 0.007 | 6.846 | 0.044 | HIGH |
| 32272 | -21.611 | 0.041 | 18.171 | 0.116 | HIGH |
| 32273 | -20.883 | 0.039 | 10.033 | 0.064 | HIGH |
| 32274 | -14.350 | 0.027 | 16.290 | 0.104 | HIGH |
| 32275 | 180.654 | 0.341 | 48.133 | 0.307 | 1.14 |
| 32278 | 63.767 | 0.120 | 53.145 | 0.339 | 2.69 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: [illegible]LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32279 | 54.422 | 0.103 | 19.919 | 0.127 | 6.71 |
| 32280 | -24.232 | 0.046 | 16.446 | 0.105 | HIGH |
| 32281 | 50.860 | 0.096 | 17.981 | 0.115 | 7.43 |
| 32282 | 33.633 | 0.063 | 16.706 | 0.107 | HIGH |
| 32283 | 22.811 | 0.043 | 40.090 | 0.256 | 6.40 |
| 32286 | 146.413 | 0.276 | 45.029 | 0.288 | 1.57 |
| 32287 | 100.209 | 0.189 | 24.800 | 0.158 | 3.37 |
| 32288 | 68.556 | 0.129 | 7.620 | 0.049 | 6.44 |
| 32289 | 55.033 | 0.104 | 4.210 | 0.027 | 8.47 |
| 32290 | -14.999 | 0.028 | 26.449 | 0.169 | HIGH |
| 32293 | 60.554 | 0.114 | 39.705 | 0.254 | 3.88 |
| 32294 | 89.840 | 0.170 | 13.617 | 0.087 | 4.45 |
| 32295 | 12.975 | 0.024 | 4.855 | 0.031 | HIGH |
| 32296 | -31.232 | 0.059 | 21.445 | 0.137 | HIGH |
| 32297 | -72.620 | 0.137 | 34.088 | 0.218 | 3.84 |
| 32300 | -16.693 | 0.031 | 48.994 | 0.313 | 5.16 |
| 32301 | 3.147 | 0.006 | 4.350 | 0.028 | HIGH |
| 32302 | 10.827 | 0.020 | 9.141 | 0.058 | HIGH |
| 32303 | -17.693 | 0.033 | 11.454 | 0.073 | HIGH |
| 32304 | -59.592 | 0.112 | 14.680 | 0.094 | 6.79 |
| 32308 | 4.389 | 0.008 | 17.535 | 0.112 | HIGH |
| 32309 | 9.751 | 0.018 | 7.969 | 0.051 | HIGH |
| 32310 | 1.450 | 0.003 | 7.795 | 0.050 | HIGH |
| 32311 | -22.195 | 0.042 | 20.742 | 0.132 | HIGH |
| 32312 | -24.128 | 0.046 | 0.836 | 0.005 | HIGH |
| 32316 | 3.689 | 0.007 | 9.146 | 0.058 | HIGH |
| 32317 | 3.365 | 0.006 | 4.009 | 0.026 | HIGH |
| 32318 | -2.257 | 0.004 | 3.526 | 0.023 | HIGH |
| 32319 | -9.207 | 0.017 | 4.470 | 0.029 | HIGH |
| 32320 | -16.144 | 0.030 | 0.366 | 0.002 | HIGH |
| 32323 | -4.953 | 0.009 | 3.464 | 0.022 | HIGH |
| 32324 | -0.251 | 0.000 | 2.900 | 0.019 | HIGH |
| 32325 | -0.685 | 0.001 | 2.298 | 0.015 | HIGH |
| 32326 | -1.897 | 0.004 | 2.016 | 0.013 | HIGH |
| 32327 | -11.107 | 0.021 | 0.624 | 0.004 | HIGH |
| 32328 | -0.830 | 0.002 | 6.399 | 0.041 | HIGH |
| 32330 | -1.740 | 0.003 | 1.866 | 0.012 | HIGH |
| 32331 | -3.024 | 0.006 | 1.562 | 0.010 | HIGH |
| 32332 | -3.777 | 0.007 | 2.346 | 0.015 | HIGH |
| 32333 | -4.827 | 0.009 | 13.912 | 0.089 | HIGH |
| 32334 | -9.595 | 0.018 | 6.416 | 0.041 | HIGH |
| 32335 | -13.034 | 0.025 | 1.763 | 0.011 | HIGH |
| 32336 | -4.947 | 0.009 | 0.519 | 0.003 | HIGH |
| 32337 | -2.876 | 0.005 | 10.522 | 0.067 | HIGH |
| 32338 | -22.756 | 0.043 | 2.978 | 0.019 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: [illegible]LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32339 | -18.777 | 0.035 | 0.612 | 0.004 | HIGH |
| 32340 | -17.906 | 0.034 | 4.385 | 0.028 | HIGH |
| 32341 | -39.806 | 0.075 | 0.856 | 0.005 | HIGH |
| 32342 | -27.712 | 0.052 | 0.303 | 0.002 | HIGH |
| 32343 | -38.164 | 0.074 | 3.096 | 0.020 | HIGH |
| 32346 | 10.446 | 0.020 | 3.293 | 0.021 | HIGH |
| 32347 | 17.199 | 0.032 | 2.680 | 0.017 | HIGH |
| 32348 | 20.430 | 0.039 | 5.849 | 0.037 | HIGH |
| 32349 | 17.471 | 0.033 | 1.264 | 0.008 | HIGH |
| 32350 | 32.449 | 0.061 | 2.613 | 0.017 | HIGH |
| 32351 | 44.092 | 0.083 | 2.337 | 0.015 | HIGH |
| 32353 | 2.414 | 0.005 | 0.425 | 0.003 | HIGH |
| 32354 | 14.781 | 0.028 | 0.295 | 0.002 | HIGH |
| 32355 | 26.161 | 0.049 | 1.976 | 0.013 | HIGH |
| 32356 | 25.338 | 0.048 | 1.452 | 0.009 | HIGH |
| 32357 | 21.536 | 0.041 | 1.298 | 0.008 | HIGH |
| 32358 | 26.367 | 0.050 | 1.705 | 0.011 | HIGH |
| 32361 | 24.915 | 0.047 | 0.323 | 0.002 | HIGH |
| 32362 | 29.641 | 0.056 | 2.326 | 0.015 | HIGH |
| 32363 | 28.287 | 0.053 | 1.109 | 0.007 | HIGH |
| 32364 | 27.047 | 0.051 | 1.260 | 0.008 | HIGH |
| 32365 | 24.848 | 0.047 | 1.608 | 0.010 | HIGH |
| 32368 | 51.955 | 0.098 | 0.248 | 0.002 | 9.20 |
| 32369 | 36.702 | 0.069 | 5.520 | 0.035 | HIGH |
| 32370 | 29.599 | 0.056 | 0.472 | 0.003 | HIGH |
| 32371 | 29.221 | 0.055 | 1.347 | 0.009 | HIGH |
| 32372 | 29.706 | 0.056 | 4.249 | 0.027 | HIGH |
| 32375 | 94.435 | 0.178 | 14.227 | 0.091 | 4.18 |
| 32376 | 52.645 | 0.099 | 6.293 | 0.040 | 8.71 |
| 32377 | 29.004 | 0.055 | 1.263 | 0.008 | HIGH |
| 32378 | 23.579 | 0.044 | 1.756 | 0.011 | HIGH |
| 32379 | 29.258 | 0.055 | 7.859 | 0.050 | HIGH |
| 32383 | 92.482 | 0.174 | 41.444 | 0.265 | 2.67 |
| 32384 | 43.862 | 0.083 | 20.294 | 0.130 | 8.03 |
| 32385 | 16.705 | 0.032 | 6.027 | 0.038 | HIGH |
| 32386 | 8.836 | 0.017 | 5.057 | 0.032 | HIGH |
| 32387 | 8.951 | 0.017 | 5.049 | 0.032 | HIGH |
| 32390 | 32.414 | 0.061 | 30.889 | 0.197 | 7.37 |
| 32391 | -40.047 | 0.076 | 34.050 | 0.217 | 5.91 |
| 32392 | -23.855 | 0.045 | 32.036 | 0.205 | 8.33 |
| 32393 | -10.191 | 0.019 | 8.496 | 0.054 | HIGH |
| 32394 | -4.323 | 0.008 | 8.118 | 0.052 | HIGH |
| 32396 | 254.022 | 0.479 | 43.988 | 0.281 | 0.70 |
| 32397 | -134.188 | 0.253 | 36.903 | 0.236 | 2.00 |
| 32398 | -159.115 | 0.300 | 63.854 | 0.408 | 0.97 |

S.S.130

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: 1224J LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32399 | -17.977 | 0.034 | 19.015 | 0.121 | HIGH |
| 32400 | -10.073 | 0.019 | 23.774 | 0.152 | HIGH |
| 32401 | 78.242 | 0.148 | 52.930 | 0.338 | 2.36 |
| 32402 | -0.080 | 0.000 | 55.507 | 0.354 | 5.14 |
| 32403 | -173.208 | 0.327 | 41.384 | 0.264 | 1.36 |
| 32404 | -190.916 | 0.360 | 39.707 | 0.254 | 1.22 |
| 32405 | -61.988 | 0.117 | 135.298 | 0.864 | 0.12 |
| 32406 | -58.640 | 0.111 | 26.635 | 0.170 | 5.42 |
| 32407 | 77.065 | 0.145 | 36.360 | 0.232 | 3.48 |
| 32408 | -155.555 | 0.293 | 46.100 | 0.294 | 1.43 |
| 32409 | -201.170 | 0.380 | 21.129 | 0.135 | 1.44 |
| 32410 | -13.224 | 0.025 | 29.061 | 0.186 | HIGH |
| 32411 | 4.498 | 0.008 | 25.883 | 0.165 | HIGH |
| 32412 | -21.074 | 0.040 | 36.547 | 0.233 | 7.47 |
| 32413 | 26.306 | 0.050 | 24.687 | 0.158 | HIGH |
| 32414 | 24.450 | 0.046 | 28.132 | 0.180 | 9.45 |
| 32415 | 12.849 | 0.024 | 36.258 | 0.232 | 8.85 |
| 32425 | -21.929 | 0.041 | 23.749 | 0.152 | HIGH |
| 32426 | -116.197 | 0.219 | 31.608 | 0.202 | 2.57 |
| 32427 | -57.059 | 0.108 | 50.194 | 0.321 | 3.10 |
| 32443 | 4.963 | 0.009 | 33.414 | 0.213 | HIGH |
| 32444 | -15.874 | 0.030 | 83.202 | 0.531 | 1.77 |
| 32445 | -181.988 | 0.343 | 34.841 | 0.222 | 1.41 |
| 32446 | -45.886 | 0.087 | 58.643 | 0.374 | 2.76 |
| 32447 | 25.174 | 0.047 | 129.783 | 0.829 | 0.30 |
| 32463 | 91.583 | 0.173 | 120.935 | 0.772 | 0.24 |
| 32464 | -214.129 | 0.404 | 23.462 | 0.150 | 1.27 |
| 32465 | 18.168 | 0.034 | 15.945 | 0.102 | HIGH |
| 33301 | -86.546 | 0.163 | 5.714 | 0.036 | 5.01 |
| 33302 | -136.481 | 0.258 | 2.711 | 0.017 | 2.87 |
| 33303 | -156.850 | 0.296 | 1.835 | 0.012 | 2.37 |
| 33304 | 46.662 | 0.088 | 4.636 | 0.030 | HIGH |
| 33305 | -227.371 | 0.429 | 1.010 | 0.006 | 1.33 |
| 33306 | 158.981 | 0.300 | 4.545 | 0.029 | 2.31 |
| 33307 | -136.251 | 0.257 | 0.794 | 0.005 | 2.89 |
| 33308 | 133.441 | 0.252 | 4.271 | 0.027 | 2.94 |
| 33313 | -22.542 | 0.043 | 1.457 | 0.009 | HIGH |
| 33314 | -16.680 | 0.031 | 1.997 | 0.013 | HIGH |
| 33319 | -174.030 | 0.328 | 1.678 | 0.011 | 2.04 |
| 33320 | -106.738 | 0.201 | 3.775 | 0.024 | 3.93 |
| 33321 | -0.241 | 0.000 | 0.731 | 0.005 | HIGH |
| 33322 | 14.918 | 0.028 | 1.817 | 0.012 | HIGH |
| 33323 | 63.128 | 0.119 | 2.239 | 0.014 | 7.35 |
| 33324 | -146.463 | 0.276 | 0.931 | 0.006 | 2.62 |
| 33327 | 13.858 | 0.026 | 7.081 | 0.045 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: [illegible]ULAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33328 | -140.640 | 0.265 | 4.478 | 0.029 | 2.74 |
| 33329 | -168.251 | 0.317 | 2.213 | 0.014 | 2.14 |
| 33330 | -147.415 | 0.278 | 6.965 | 0.044 | 2.54 |
| 33331 | -6.001 | 0.011 | 0.715 | 0.005 | HIGH |
| 33332 | -22.721 | 0.043 | 1.386 | 0.009 | HIGH |
| 33333 | 24.297 | 0.046 | 1.805 | 0.012 | HIGH |
| 33334 | -95.433 | 0.180 | 2.328 | 0.015 | 4.53 |
| 33338 | -103.232 | 0.195 | 17.344 | 0.111 | 3.63 |
| 33339 | -172.511 | 0.325 | 5.338 | 0.034 | 2.05 |
| 33340 | -123.100 | 0.232 | 3.062 | 0.020 | 3.29 |
| 33341 | -129.557 | 0.244 | 6.424 | 0.041 | 3.03 |
| 33342 | -10.647 | 0.020 | 1.496 | 0.010 | HIGH |
| 33343 | -44.482 | 0.084 | 1.597 | 0.010 | HIGH |
| 33344 | -32.622 | 0.062 | 1.729 | 0.011 | HIGH |
| 33345 | -17.139 | 0.032 | 3.145 | 0.020 | HIGH |
| 33350 | -156.866 | 0.296 | 16.878 | 0.108 | 2.16 |
| 33351 | -100.383 | 0.189 | 5.916 | 0.038 | 4.19 |
| 33352 | -78.823 | 0.149 | 3.811 | 0.024 | 5.66 |
| 33353 | -96.205 | 0.182 | 4.027 | 0.026 | 4.46 |
| 33354 | -14.845 | 0.028 | 2.668 | 0.017 | HIGH |
| 33355 | -49.156 | 0.093 | 1.940 | 0.012 | 9.73 |
| 33356 | -39.662 | 0.075 | 2.492 | 0.016 | HIGH |
| 33357 | -49.620 | 0.094 | 2.573 | 0.016 | 9.60 |
| 33363 | -59.303 | 0.112 | 11.520 | 0.074 | 7.18 |
| 33364 | -68.948 | 0.130 | 2.088 | 0.013 | 6.66 |
| 33365 | -48.131 | 0.091 | 2.588 | 0.017 | 9.92 |
| 33366 | -41.801 | 0.079 | 2.688 | 0.017 | HIGH |
| 33367 | -25.995 | 0.049 | 3.249 | 0.021 | HIGH |
| 33368 | -53.594 | 0.101 | 1.349 | 0.009 | 8.87 |
| 33369 | -41.947 | 0.079 | 2.403 | 0.015 | HIGH |
| 33370 | -36.253 | 0.068 | 2.947 | 0.019 | HIGH |
| 33371 | -84.778 | 0.160 | 5.431 | 0.035 | 5.14 |
| 33376 | 21.834 | 0.041 | 7.941 | 0.051 | HIGH |
| 33377 | -57.321 | 0.108 | 2.918 | 0.019 | 8.17 |
| 33378 | -52.212 | 0.099 | 2.295 | 0.015 | 9.09 |
| 33379 | -28.031 | 0.053 | 2.408 | 0.015 | HIGH |
| 33380 | 12.552 | 0.024 | 8.938 | 0.057 | HIGH |
| 33381 | -52.896 | 0.100 | 3.396 | 0.022 | 8.90 |
| 33382 | -62.505 | 0.118 | 0.836 | 0.005 | 7.47 |
| 33383 | -52.507 | 0.099 | 0.664 | 0.004 | 9.09 |
| 33384 | -45.100 | 0.085 | 1.306 | 0.008 | HIGH |
| 33385 | -41.038 | 0.077 | 2.715 | 0.017 | HIGH |
| 33386 | -33.163 | 0.063 | 7.532 | 0.048 | HIGH |
| 33390 | -32.255 | 0.061 | 4.587 | 0.029 | HIGH |
| 33391 | -14.733 | 0.028 | 0.936 | 0.006 | HIGH |

S.S.132

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: REQ/ LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33392 | -37.608 | 0.071 | 1.191 | 0.008 | HIGH |
| 33393 | -15.686 | 0.030 | 3.026 | 0.019 | HIGH |
| 33394 | 9.201 | 0.017 | 9.717 | 0.062 | HIGH |
| 33396 | 116.447 | 0.220 | 1.500 | 0.010 | 3.55 |
| 33397 | 96.000 | 0.181 | 1.899 | 0.012 | 4.51 |
| 33398 | 78.420 | 0.148 | 1.359 | 0.009 | 5.75 |
| 33399 | 63.845 | 0.120 | 0.777 | 0.005 | 7.29 |
| 33400 | 45.867 | 0.087 | 0.207 | 0.001 | HIGH |
| 33401 | 8.715 | 0.016 | 0.225 | 0.001 | HIGH |
| 33402 | -58.563 | 0.110 | 0.806 | 0.005 | 8.04 |
| 33403 | -160.900 | 0.304 | 5.146 | 0.033 | 2.27 |
| 33406 | 81.912 | 0.155 | 4.895 | 0.031 | 5.37 |
| 33407 | 85.470 | 0.161 | 3.393 | 0.022 | 5.15 |
| 33408 | 73.980 | 0.140 | 2.550 | 0.016 | 6.13 |
| 33409 | 64.622 | 0.122 | 0.660 | 0.004 | 7.20 |
| 33410 | 52.904 | 0.100 | 0.349 | 0.002 | 9.02 |
| 33411 | 6.198 | 0.012 | 0.419 | 0.003 | HIGH |
| 33412 | -58.508 | 0.110 | 4.043 | 0.026 | 7.92 |
| 33413 | -233.157 | 0.440 | 11.002 | 0.070 | 1.22 |
| 33415 | 84.431 | 0.159 | 6.249 | 0.040 | 5.14 |
| 33416 | 92.182 | 0.174 | 6.218 | 0.040 | 4.64 |
| 33417 | 86.635 | 0.163 | 3.233 | 0.021 | 5.08 |
| 33418 | 96.625 | 0.182 | 0.781 | 0.005 | 4.48 |
| 33419 | 81.264 | 0.153 | 0.244 | 0.002 | 5.52 |
| 33420 | 70.444 | 0.133 | 0.327 | 0.002 | 6.52 |
| 33421 | 104.602 | 0.197 | 3.870 | 0.025 | 4.03 |
| 33424 | 99.337 | 0.187 | 12.133 | 0.077 | 4.03 |
| 33425 | 112.284 | 0.212 | 10.909 | 0.070 | 3.52 |
| 33426 | 160.654 | 0.303 | 1.691 | 0.011 | 2.30 |
| 33432 | 73.238 | 0.138 | 23.141 | 0.148 | 4.77 |
| 33433 | 93.700 | 0.177 | 10.816 | 0.069 | 4.37 |
| 33440 | 23.548 | 0.044 | 50.215 | 0.321 | 4.52 |
| 33450 | -12.996 | 0.025 | 27.907 | 0.178 | HIGH |
| 33455 | 113.384 | 0.214 | 16.907 | 0.108 | 3.27 |
| 33456 | 199.059 | 0.376 | 8.480 | 0.054 | 1.62 |
| 33457 | -31.770 | 0.060 | 14.971 | 0.096 | HIGH |
| 33463 | 289.897 | 0.547 | 8.414 | 0.054 | 0.81 |
| 33464 | 261.671 | 0.494 | 7.252 | 0.046 | 1.01 |
| 33465 | 268.795 | 0.507 | 6.236 | 0.040 | 0.96 |
| 33467 | 37.703 | 0.071 | 13.056 | 0.083 | HIGH |
| 33470 | 356.057 | 0.672 | 8.310 | 0.053 | 0.48 |
| 33471 | 300.279 | 0.567 | 7.834 | 0.050 | 0.75 |
| 33472 | 251.253 | 0.474 | 4.520 | 0.029 | 1.10 |
| 33473 | 194.193 | 0.366 | 5.154 | 0.033 | 1.71 |
| 33474 | 94.784 | 0.179 | 10.287 | 0.066 | 4.34 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: REGULAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33475 | 169.053 | 0.319 | 2.740 | 0.017 | 2.13 |
| 33476 | 247.950 | 0.468 | 5.239 | 0.033 | 1.13 |
| 33477 | 257.753 | 0.486 | 5.264 | 0.034 | 1.05 |
| 33478 | 236.461 | 0.446 | 2.923 | 0.019 | 1.24 |
| 33479 | 207.794 | 0.392 | 9.730 | 0.062 | 1.50 |
| 33480 | 191.779 | 0.362 | 7.987 | 0.051 | 1.72 |
| 33481 | 242.498 | 0.458 | 3.558 | 0.023 | 1.18 |
| 33482 | 237.603 | 0.448 | 3.785 | 0.024 | 1.22 |
| 33483 | 217.074 | 0.410 | 3.645 | 0.023 | 1.43 |
| 33484 | 202.048 | 0.381 | 9.415 | 0.060 | 1.57 |
| 33485 | 225.031 | 0.425 | 5.546 | 0.035 | 1.34 |
| 33486 | 233.993 | 0.441 | 4.438 | 0.028 | 1.26 |
| 33487 | 210.127 | 0.396 | 4.545 | 0.029 | 1.51 |
| 33488 | 178.668 | 0.337 | 6.663 | 0.043 | 1.93 |
| 33489 | 205.852 | 0.389 | 7.600 | 0.049 | 1.54 |
| 33490 | 211.533 | 0.399 | 7.170 | 0.046 | 1.48 |
| 33491 | 153.909 | 0.290 | 6.444 | 0.041 | 2.40 |
| 33492 | 313.177 | 0.591 | 21.002 | 0.134 | 0.61 |
| 33499 | 110.838 | 0.209 | 5.609 | 0.036 | 3.72 |
| 33500 | -24.988 | 0.047 | 1.717 | 0.011 | HIGH |
| 33501 | -97.472 | 0.184 | 1.887 | 0.012 | 4.42 |
| 33502 | -147.882 | 0.279 | 1.258 | 0.008 | 2.58 |
| 33503 | -188.328 | 0.355 | 0.763 | 0.005 | 1.81 |
| 33504 | -250.293 | 0.472 | 2.553 | 0.016 | 1.11 |
| 33505 | -341.928 | 0.645 | 16.879 | 0.108 | 0.50 |
| 33509 | -140.433 | 0.265 | 3.844 | 0.025 | 2.75 |
| 33510 | -138.560 | 0.261 | 3.650 | 0.023 | 2.80 |
| 33511 | -187.487 | 0.354 | 3.555 | 0.023 | 1.82 |
| 33512 | -208.704 | 0.394 | 1.817 | 0.012 | 1.54 |
| 33513 | -229.185 | 0.432 | 1.258 | 0.008 | 1.31 |
| 33514 | -253.002 | 0.477 | 1.679 | 0.011 | 1.09 |
| 33515 | -249.396 | 0.471 | 6.040 | 0.039 | 1.11 |
| 33518 | -193.251 | 0.365 | 2.152 | 0.014 | 1.74 |
| 33519 | -129.760 | 0.245 | 6.868 | 0.044 | 3.02 |
| 33520 | -202.408 | 0.382 | 4.347 | 0.028 | 1.61 |
| 33521 | -258.485 | 0.488 | 3.875 | 0.025 | 1.04 |
| 33522 | -248.675 | 0.469 | 1.947 | 0.012 | 1.13 |
| 33523 | -253.493 | 0.478 | 2.285 | 0.015 | 1.09 |
| 33524 | -245.444 | 0.463 | 2.928 | 0.019 | 1.15 |
| 33530 | -356.748 | 0.673 | 5.856 | 0.037 | 0.48 |
| 33531 | -277.830 | 0.524 | 3.989 | 0.025 | 0.90 |
| 33532 | -228.763 | 0.432 | 5.604 | 0.036 | 1.30 |
| 33539 | -237.292 | 0.448 | 7.804 | 0.050 | 1.21 |
| 33540 | -195.238 | 0.368 | 9.306 | 0.059 | 1.66 |
| 33550 | -106.687 | 0.201 | 16.606 | 0.106 | 3.52 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: R33J LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33553 | -324.266 | 0.612 | 3.865 | 0.025 | 0.63 |
| 33554 | -207.443 | 0.391 | 0.669 | 0.004 | 1.55 |
| 33559 | -25.235 | 0.048 | 14.438 | 0.092 | HIGH |
| 33561 | -244.075 | 0.461 | 1.136 | 0.007 | 1.17 |
| 33562 | -296.035 | 0.559 | 0.786 | 0.005 | 0.79 |
| 33563 | -265.841 | 0.502 | 0.306 | 0.002 | 0.99 |
| 33568 | -174.250 | 0.329 | 1.893 | 0.012 | 2.04 |
| 33569 | -204.914 | 0.387 | 0.436 | 0.003 | 1.59 |
| 33570 | -251.423 | 0.474 | 1.015 | 0.006 | 1.11 |
| 33571 | -266.363 | 0.503 | 1.298 | 0.008 | 0.99 |
| 33574 | -30.240 | 0.057 | 21.735 | 0.139 | HIGH |
| 33575 | -169.197 | 0.319 | 1.292 | 0.008 | 2.13 |
| 33576 | -171.718 | 0.324 | 0.376 | 0.002 | 2.09 |
| 33577 | -183.217 | 0.346 | 0.719 | 0.005 | 1.89 |
| 33578 | -172.971 | 0.326 | 0.640 | 0.004 | 2.06 |
| 33579 | -124.368 | 0.235 | 2.714 | 0.017 | 3.25 |
| 33580 | -93.788 | 0.177 | 28.089 | 0.179 | 3.42 |
| 33581 | -159.316 | 0.301 | 1.582 | 0.010 | 2.32 |
| 33582 | -143.337 | 0.270 | 0.893 | 0.006 | 2.70 |
| 33583 | -152.456 | 0.288 | 1.709 | 0.011 | 2.47 |
| 33584 | -157.788 | 0.298 | 4.933 | 0.032 | 2.33 |
| 33585 | -146.874 | 0.277 | 22.355 | 0.143 | 2.22 |
| 33586 | -145.096 | 0.274 | 2.945 | 0.019 | 2.64 |
| 33587 | -126.865 | 0.239 | 2.037 | 0.013 | 3.17 |
| 33588 | -138.107 | 0.261 | 6.168 | 0.039 | 2.79 |
| 33589 | -132.393 | 0.250 | 11.949 | 0.076 | 2.83 |
| 33590 | -131.771 | 0.249 | 4.380 | 0.028 | 2.99 |
| 33591 | -117.487 | 0.222 | 5.921 | 0.038 | 3.45 |
| 33592 | -115.257 | 0.217 | 10.965 | 0.070 | 3.41 |
| 33593 | -120.821 | 0.228 | 4.515 | 0.029 | 3.35 |
| 33594 | -106.126 | 0.200 | 12.554 | 0.080 | 3.71 |
| 33595 | -98.871 | 0.187 | 4.878 | 0.031 | 4.29 |
| 42201 | -65.673 | 0.124 | 1.707 | 0.011 | 7.05 |
| 42202 | 46.374 | 0.087 | 3.115 | 0.020 | HIGH |
| 42203 | 39.321 | 0.074 | 3.038 | 0.019 | HIGH |
| 42204 | -112.517 | 0.212 | 0.467 | 0.003 | 3.71 |
| 42205 | -232.894 | 0.439 | 16.009 | 0.102 | 1.18 |
| 42206 | 40.647 | 0.077 | 26.118 | 0.167 | 7.32 |
| 42207 | -295.149 | 0.557 | 22.193 | 0.142 | 0.70 |
| 42208 | 95.121 | 0.179 | 32.155 | 0.205 | 3.13 |
| 42215 | -68.138 | 0.129 | 3.210 | 0.021 | 6.71 |
| 42216 | -91.378 | 0.172 | 3.071 | 0.020 | 4.77 |
| 42222 | -286.532 | 0.541 | 15.123 | 0.097 | 0.79 |
| 42223 | -294.569 | 0.556 | 52.487 | 0.335 | 0.42 |
| 42224 | -77.755 | 0.147 | 7.769 | 0.050 | 5.58 |

S&I'S'S

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: EZGU LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42225 | -75.819 | 0.143 | 5.100 | 0.033 | 5.87 |
| 42226 | -61.641 | 0.116 | 6.115 | 0.039 | 7.35 |
| 42227 | -44.220 | 0.083 | 4.003 | 0.026 | HIGH |
| 42228 | -27.223 | 0.051 | 22.281 | 0.142 | HIGH |
| 42229 | -165.399 | 0.312 | 25.064 | 0.160 | 1.84 |
| 42230 | -184.585 | 0.348 | 39.046 | 0.249 | 1.29 |
| 42231 | -215.826 | 0.407 | 42.293 | 0.270 | 0.97 |
| 42232 | -294.925 | 0.556 | 37.312 | 0.238 | 0.57 |
| 42233 | -323.771 | 0.611 | 74.583 | 0.476 | 0.13 |
| 42234 | -66.080 | 0.125 | 2.552 | 0.016 | 6.97 |
| 42235 | -60.355 | 0.114 | 1.231 | 0.008 | 7.77 |
| 42236 | -49.352 | 0.093 | 1.447 | 0.009 | 9.71 |
| 42237 | -27.422 | 0.052 | 5.583 | 0.036 | HIGH |
| 42238 | -14.346 | 0.027 | 7.275 | 0.046 | HIGH |
| 42239 | -52.572 | 0.099 | 52.842 | 0.337 | 3.02 |
| 42240 | -155.202 | 0.293 | 129.227 | 0.825 | -0.01 |
| 42241 | -188.104 | 0.355 | 150.348 | 0.960 | -0.22 |
| 42242 | -229.990 | 0.434 | 105.655 | 0.675 | 0.07 |
| 42243 | -263.198 | 0.497 | 38.398 | 0.245 | 0.72 |
| 42244 | -269.507 | 0.509 | 60.238 | 0.385 | 0.44 |
| 42245 | -72.998 | 0.138 | 4.890 | 0.031 | 6.14 |
| 42246 | -28.008 | 0.053 | 9.732 | 0.062 | HIGH |
| 42247 | -54.190 | 0.102 | 12.092 | 0.077 | 7.81 |
| 42248 | -23.505 | 0.044 | 2.732 | 0.017 | HIGH |
| 42249 | 14.779 | 0.028 | 11.419 | 0.073 | HIGH |
| 42250 | 62.149 | 0.117 | 23.913 | 0.153 | 5.47 |
| 42251 | -204.397 | 0.386 | 446.489 | 2.851 | -0.85 |
| 42252 | -26.829 | 0.051 | 1.136 | 0.007 | HIGH |
| 42253 | -244.666 | 0.462 | 407.363 | 2.601 | -0.83 |
| 42254 | -219.051 | 0.413 | 34.603 | 0.221 | 1.06 |
| 42255 | -211.609 | 0.399 | 38.240 | 0.244 | 1.07 |
| 42256 | -209.549 | 0.395 | 37.775 | 0.241 | 1.09 |
| 42257 | -63.252 | 0.119 | 2.985 | 0.019 | 7.31 |
| 42258 | -38.268 | 0.072 | 3.162 | 0.020 | HIGH |
| 42259 | -63.808 | 0.120 | 2.956 | 0.019 | 7.24 |
| 42260 | -30.535 | 0.058 | 4.034 | 0.026 | HIGH |
| 42261 | -13.695 | 0.026 | 4.685 | 0.030 | HIGH |
| 42262 | 7.604 | 0.014 | 62.566 | 0.400 | 3.65 |
| 42263 | 117.824 | 0.222 | 21.766 | 0.139 | 2.94 |
| 42264 | -78.377 | 0.148 | 226.938 | 1.449 | -0.52 |
| 42265 | -126.753 | 0.239 | 193.164 | 1.233 | -0.41 |
| 42266 | -143.994 | 0.272 | 70.525 | 0.450 | 0.93 |
| 42267 | -142.181 | 0.268 | 19.780 | 0.126 | 2.39 |
| 42268 | -137.476 | 0.259 | 19.639 | 0.125 | 2.50 |
| 42269 | -139.741 | 0.264 | 16.680 | 0.107 | 2.53 |

S.S. 136

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: 224J LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42270 | 24.224 | 0.046 | 1.854 | 0.012 | HIGH |
| 42271 | 0.830 | 0.002 | 2.017 | 0.013 | HIGH |
| 42272 | -4.000 | 0.008 | 2.955 | 0.019 | HIGH |
| 42273 | -10.193 | 0.019 | 2.147 | 0.014 | HIGH |
| 42274 | -21.093 | 0.040 | 4.341 | 0.028 | HIGH |
| 42275 | 53.973 | 0.102 | 7.868 | 0.050 | 8.33 |
| 42278 | 9.265 | 0.017 | 4.707 | 0.030 | HIGH |
| 42279 | -24.145 | 0.046 | 6.697 | 0.043 | HIGH |
| 42280 | -41.859 | 0.079 | 5.409 | 0.035 | HIGH |
| 42281 | -52.987 | 0.100 | 8.936 | 0.057 | 8.38 |
| 42282 | -78.945 | 0.149 | 11.055 | 0.071 | 5.30 |
| 42283 | -17.531 | 0.033 | 9.361 | 0.060 | HIGH |
| 42286 | -15.668 | 0.030 | 5.018 | 0.032 | HIGH |
| 42287 | -30.537 | 0.058 | 4.104 | 0.026 | HIGH |
| 42288 | -61.068 | 0.115 | 2.862 | 0.018 | 7.61 |
| 42289 | -83.044 | 0.157 | 6.943 | 0.044 | 5.21 |
| 42290 | -103.127 | 0.195 | 6.369 | 0.041 | 4.04 |
| 42293 | -22.187 | 0.042 | 8.397 | 0.054 | HIGH |
| 42294 | -40.628 | 0.077 | 6.924 | 0.044 | HIGH |
| 42295 | -78.627 | 0.148 | 6.430 | 0.041 | 5.57 |
| 42296 | -91.812 | 0.173 | 9.905 | 0.063 | 4.52 |
| 42297 | -108.646 | 0.205 | 12.801 | 0.082 | 3.60 |
| 42300 | -15.361 | 0.029 | 18.360 | 0.117 | HIGH |
| 42301 | -37.724 | 0.071 | 17.010 | 0.109 | 9.90 |
| 42302 | -84.545 | 0.160 | 17.763 | 0.113 | 4.50 |
| 42303 | -46.691 | 0.088 | 15.196 | 0.097 | 8.53 |
| 42304 | -71.577 | 0.135 | 16.585 | 0.106 | 5.46 |
| 42308 | -13.726 | 0.026 | 72.795 | 0.465 | 2.48 |
| 42309 | -3.118 | 0.006 | 6.859 | 0.044 | HIGH |
| 42310 | -55.722 | 0.105 | 49.578 | 0.317 | 3.19 |
| 42311 | -62.583 | 0.118 | 42.394 | 0.271 | 3.55 |
| 42312 | -38.294 | 0.072 | 40.789 | 0.260 | 4.98 |
| 42316 | 21.493 | 0.041 | 28.101 | 0.179 | HIGH |
| 42317 | 20.512 | 0.039 | 273.097 | 1.744 | -0.63 |
| 42318 | -36.725 | 0.067 | 120.831 | 0.772 | 0.42 |
| 42319 | -3.223 | 0.006 | 98.026 | 0.626 | 1.24 |
| 42320 | 18.569 | 0.035 | 40.121 | 0.256 | 6.86 |
| 42323 | 105.647 | 0.199 | 246.631 | 1.575 | -0.59 |
| 42324 | 14.141 | 0.027 | 1.695 | 0.011 | HIGH |
| 42325 | 7.430 | 0.014 | 333.108 | 2.127 | -0.73 |
| 42326 | 49.396 | 0.093 | 33.002 | 0.211 | 5.30 |
| 42327 | 108.423 | 0.205 | 50.692 | 0.324 | 1.91 |
| 42329 | 52.783 | 0.100 | 179.754 | 1.148 | -0.27 |
| 42330 | 67.665 | 0.128 | 145.888 | 0.932 | -0.01 |
| 42331 | 42.220 | 0.080 | 99.104 | 0.633 | 0.89 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: ZERO LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42332 | 75.124 | 0.142 | 44.941 | 0.287 | 2.93 |
| 42333 | 103.167 | 0.195 | 48.964 | 0.313 | 2.07 |
| 42334 | 59.286 | 0.112 | 120.852 | 0.772 | 0.34 |
| 42335 | 54.954 | 0.104 | 58.297 | 0.372 | 2.56 |
| 42336 | 47.277 | 0.089 | 43.473 | 0.278 | 4.12 |
| 42337 | 55.168 | 0.104 | 72.642 | 0.464 | 1.74 |
| 42338 | 48.048 | 0.091 | 38.010 | 0.243 | 4.73 |
| 42339 | 40.473 | 0.076 | 28.258 | 0.180 | 6.92 |
| 42340 | 39.079 | 0.074 | 53.292 | 0.340 | 3.44 |
| 42341 | 30.125 | 0.057 | 3.814 | 0.024 | HIGH |
| 42342 | 30.576 | 0.058 | 20.389 | 0.130 | HIGH |
| 42343 | 17.501 | 0.033 | 2.358 | 0.015 | HIGH |
| 42346 | 106.860 | 0.202 | 26.926 | 0.172 | 3.04 |
| 42347 | -44.954 | 0.085 | 17.190 | 0.110 | 8.46 |
| 42348 | 2.891 | 0.005 | 17.306 | 0.111 | HIGH |
| 42349 | 6.534 | 0.012 | 15.315 | 0.098 | HIGH |
| 42350 | 2.214 | 0.004 | 10.497 | 0.067 | HIGH |
| 42351 | 4.651 | 0.009 | 9.578 | 0.061 | HIGH |
| 42353 | -68.218 | 0.129 | 91.921 | 0.587 | 0.91 |
| 42354 | -137.006 | 0.259 | 32.683 | 0.209 | 2.10 |
| 42355 | -47.591 | 0.090 | 65.944 | 0.421 | 2.23 |
| 42356 | -14.075 | 0.027 | 66.987 | 0.428 | 2.96 |
| 42357 | -20.764 | 0.039 | 34.599 | 0.221 | 8.06 |
| 42358 | -22.072 | 0.042 | 37.100 | 0.237 | 7.19 |
| 42361 | -98.889 | 0.187 | 62.042 | 0.396 | 1.60 |
| 42362 | -64.282 | 0.121 | 49.601 | 0.317 | 2.92 |
| 42363 | -22.774 | 0.043 | 130.693 | 0.835 | 0.30 |
| 42364 | -47.509 | 0.090 | 83.830 | 0.535 | 1.35 |
| 42365 | -45.730 | 0.086 | 73.005 | 0.466 | 1.86 |
| 42368 | -33.499 | 0.063 | 45.463 | 0.290 | 4.62 |
| 42369 | -12.007 | 0.023 | 44.480 | 0.284 | 6.51 |
| 42370 | 21.422 | 0.040 | 123.015 | 0.786 | 0.44 |
| 42371 | -99.836 | 0.188 | 233.196 | 1.489 | -0.54 |
| 42372 | -77.459 | 0.146 | 167.193 | 1.068 | -0.21 |
| 42375 | 21.950 | 0.041 | 18.561 | 0.119 | HIGH |
| 42376 | -36.761 | 0.069 | 29.531 | 0.189 | 7.11 |
| 42377 | -44.041 | 0.083 | 131.394 | 0.839 | 0.22 |
| 42378 | -21.974 | 0.041 | 1.269 | 0.008 | HIGH |
| 42379 | -52.642 | 0.099 | 175.816 | 1.123 | -0.24 |
| 42383 | 31.527 | 0.059 | 9.921 | 0.063 | HIGH |
| 42384 | 21.570 | 0.041 | 5.119 | 0.033 | HIGH |
| 42385 | 59.857 | 0.113 | 14.762 | 0.094 | 6.75 |
| 42386 | -58.679 | 0.111 | 69.501 | 0.444 | 1.84 |
| 42387 | -52.141 | 0.098 | 77.849 | 0.497 | 1.55 |
| 42390 | 59.531 | 0.112 | 1.074 | 0.007 | 7.89 |

S.S. #18

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: REGULAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42391 | 43.790 | 0.083 | 4.079 | 0.026 | HIGH |
| 42392 | 31.058 | 0.059 | 5.780 | 0.037 | HIGH |
| 42393 | -15.585 | 0.029 | 20.159 | 0.129 | HIGH |
| 42394 | -9.595 | 0.018 | 32.024 | 0.204 | HIGH |
| 42396 | 78.562 | 0.148 | 6.053 | 0.039 | 5.60 |
| 42397 | 59.497 | 0.112 | 6.073 | 0.039 | 7.65 |
| 42398 | 37.910 | 0.072 | 0.571 | 0.004 | HIGH |
| 42399 | 0.063 | 0.000 | 6.672 | 0.043 | HIGH |
| 42400 | -21.461 | 0.040 | 24.371 | 0.156 | HIGH |
| 42401 | 63.123 | 0.119 | 1.609 | 0.010 | 7.37 |
| 42402 | 60.338 | 0.114 | 3.154 | 0.020 | 7.70 |
| 42403 | 49.623 | 0.094 | 4.535 | 0.029 | 9.45 |
| 42404 | 19.346 | 0.037 | 3.325 | 0.021 | HIGH |
| 42405 | 2.888 | 0.005 | 9.017 | 0.058 | HIGH |
| 42406 | 54.395 | 0.103 | 5.608 | 0.036 | 8.47 |
| 42407 | 47.496 | 0.090 | 4.128 | 0.026 | 9.95 |
| 42408 | 24.167 | 0.046 | 13.463 | 0.086 | HIGH |
| 42409 | 16.872 | 0.032 | 9.162 | 0.059 | HIGH |
| 42410 | 32.898 | 0.062 | 3.171 | 0.020 | HIGH |
| 42411 | 33.190 | 0.063 | 5.343 | 0.034 | HIGH |
| 42412 | 20.041 | 0.038 | 5.399 | 0.034 | HIGH |
| 42413 | 20.232 | 0.038 | 3.513 | 0.022 | HIGH |
| 42414 | -3.070 | 0.006 | 3.614 | 0.023 | HIGH |
| 42415 | -12.556 | 0.024 | 4.106 | 0.026 | HIGH |
| 42455 | -167.201 | 0.315 | 62.065 | 0.396 | 0.95 |
| 42456 | -290.463 | 0.548 | 43.449 | 0.277 | 0.53 |
| 43301 | -80.063 | 0.151 | 1.188 | 0.008 | 5.61 |
| 43302 | 74.888 | 0.141 | 5.960 | 0.038 | 5.92 |
| 43303 | 146.185 | 0.276 | 7.917 | 0.051 | 2.56 |
| 43304 | -153.975 | 0.291 | 1.906 | 0.012 | 2.44 |
| 43306 | 371.828 | 0.702 | 2.153 | 0.014 | 0.42 |
| 43308 | -241.083 | 0.455 | 6.779 | 0.043 | 1.18 |
| 43307 | 286.171 | 0.540 | 4.306 | 0.027 | 0.85 |
| 43308 | -151.581 | 0.286 | 5.793 | 0.037 | 2.46 |
| 43313 | -23.962 | 0.045 | 2.213 | 0.014 | HIGH |
| 43314 | -83.725 | 0.158 | 2.721 | 0.017 | 5.30 |
| 43319 | 299.519 | 0.565 | 0.739 | 0.005 | 0.77 |
| 43320 | 217.865 | 0.411 | 9.977 | 0.064 | 1.39 |
| 43321 | -20.988 | 0.040 | 5.518 | 0.035 | HIGH |
| 43322 | -43.765 | 0.083 | 1.643 | 0.010 | HIGH |
| 43323 | -39.716 | 0.075 | 2.023 | 0.013 | HIGH |
| 43324 | -31.737 | 0.060 | 9.877 | 0.063 | HIGH |
| 43327 | 151.405 | 0.286 | 11.412 | 0.073 | 2.38 |
| 43328 | 185.282 | 0.350 | 0.473 | 0.003 | 1.86 |
| 43329 | 269.328 | 0.508 | 4.477 | 0.029 | 0.96 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: [illegible] LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43330 | 245.731 | 0.464 | 12.713 | 0.081 | 1.10 |
| 43331 | -7.626 | 0.014 | 6.020 | 0.038 | HIGH |
| 43332 | 2.499 | 0.005 | 4.149 | 0.026 | HIGH |
| 43333 | 6.029 | 0.011 | 2.050 | 0.013 | HIGH |
| 43334 | 46.559 | 0.088 | 17.496 | 0.112 | 8.14 |
| 43338 | 56.216 | 0.106 | 8.690 | 0.055 | 7.90 |
| 43339 | 145.865 | 0.275 | 2.883 | 0.018 | 2.62 |
| 43340 | 185.792 | 0.351 | 7.334 | 0.047 | 1.81 |
| 43341 | 209.168 | 0.395 | 11.188 | 0.071 | 1.47 |
| 43342 | -8.662 | 0.016 | 4.690 | 0.030 | HIGH |
| 43343 | 6.926 | 0.013 | 5.508 | 0.035 | HIGH |
| 43344 | -2.563 | 0.005 | 4.625 | 0.030 | HIGH |
| 43345 | -5.487 | 0.010 | 6.893 | 0.044 | HIGH |
| 43346 | 130.231 | 0.246 | 19.827 | 0.127 | 2.67 |
| 43349 | -100.233 | 0.189 | 7.194 | 0.046 | 4.16 |
| 43350 | 149.943 | 0.283 | 2.985 | 0.019 | 2.52 |
| 43351 | 154.813 | 0.292 | 4.770 | 0.030 | 2.40 |
| 43352 | 153.210 | 0.289 | 7.705 | 0.049 | 2.40 |
| 43353 | 174.398 | 0.329 | 6.642 | 0.042 | 2.00 |
| 43354 | -27.305 | 0.052 | 4.661 | 0.030 | HIGH |
| 43355 | 0.151 | 0.000 | 4.649 | 0.030 | HIGH |
| 43356 | -1.206 | 0.002 | 4.638 | 0.030 | HIGH |
| 43357 | -0.335 | 0.001 | 4.194 | 0.027 | HIGH |
| 43358 | 15.947 | 0.030 | 7.934 | 0.051 | HIGH |
| 43359 | -25.254 | 0.048 | 13.436 | 0.086 | HIGH |
| 43360 | 16.366 | 0.031 | 15.215 | 0.097 | HIGH |
| 43361 | 69.880 | 0.132 | 5.002 | 0.032 | 6.45 |
| 43362 | 90.515 | 0.171 | 2.816 | 0.018 | 4.83 |
| 43363 | 125.513 | 0.237 | 3.233 | 0.021 | 3.20 |
| 43364 | 130.489 | 0.246 | 4.418 | 0.028 | 3.03 |
| 43365 | 124.374 | 0.235 | 5.913 | 0.038 | 3.20 |
| 43366 | 127.955 | 0.241 | 4.509 | 0.029 | 3.11 |
| 43367 | -54.888 | 0.104 | 13.413 | 0.086 | 7.54 |
| 43368 | -17.559 | 0.033 | 3.034 | 0.019 | HIGH |
| 43369 | -2.503 | 0.005 | 3.085 | 0.020 | HIGH |
| 43370 | 7.054 | 0.013 | 3.094 | 0.020 | HIGH |
| 43371 | 18.698 | 0.035 | 2.117 | 0.014 | HIGH |
| 43372 | 11.097 | 0.021 | 6.187 | 0.040 | HIGH |
| 43373 | 18.161 | 0.034 | 8.034 | 0.051 | HIGH |
| 43374 | 46.168 | 0.087 | 7.957 | 0.051 | 9.81 |
| 43375 | 60.504 | 0.114 | 2.536 | 0.016 | 7.70 |
| 43376 | 78.388 | 0.148 | 1.433 | 0.009 | 5.75 |
| 43377 | 101.253 | 0.191 | 1.771 | 0.011 | 4.22 |
| 43378 | 109.859 | 0.207 | 2.060 | 0.013 | 3.81 |
| 43379 | 109.231 | 0.206 | 5.834 | 0.037 | 3.78 |

04.5.5

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: [illegible] LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43380 | 75.132 | 0.142 | 21.302 | 0.136 | 4.81 |
| 43382 | 4.998 | 0.009 | 4.200 | 0.027 | HIGH |
| 43383 | 10.992 | 0.021 | 2.283 | 0.015 | HIGH |
| 43384 | 17.389 | 0.033 | 1.385 | 0.009 | HIGH |
| 43385 | 25.886 | 0.049 | 1.516 | 0.010 | HIGH |
| 43386 | 27.212 | 0.051 | 1.459 | 0.009 | HIGH |
| 43387 | 29.947 | 0.057 | 2.300 | 0.015 | HIGH |
| 43388 | 38.377 | 0.072 | 2.301 | 0.015 | HIGH |
| 43389 | 48.642 | 0.092 | 1.963 | 0.013 | 9.84 |
| 43390 | 56.314 | 0.106 | 0.944 | 0.006 | 8.40 |
| 43391 | 68.163 | 0.129 | 0.592 | 0.004 | 6.77 |
| 43392 | 83.491 | 0.158 | 0.409 | 0.003 | 5.35 |
| 43393 | 96.754 | 0.183 | 2.538 | 0.016 | 4.46 |
| 43394 | 125.602 | 0.237 | 14.457 | 0.092 | 2.96 |
| 43397 | -95.951 | 0.181 | 6.546 | 0.042 | 4.41 |
| 43398 | -107.925 | 0.204 | 3.059 | 0.020 | 3.89 |
| 43399 | -101.011 | 0.191 | 1.015 | 0.006 | 4.24 |
| 43400 | -82.871 | 0.156 | 2.909 | 0.019 | 5.36 |
| 43401 | -59.447 | 0.112 | 3.242 | 0.021 | 7.83 |
| 43402 | -6.040 | 0.011 | 2.754 | 0.018 | HIGH |
| 43403 | 107.453 | 0.203 | 6.999 | 0.045 | 3.83 |
| 43406 | -64.060 | 0.121 | 2.711 | 0.017 | 7.22 |
| 43407 | -77.314 | 0.146 | 2.959 | 0.019 | 5.81 |
| 43408 | -92.274 | 0.174 | 2.926 | 0.019 | 4.71 |
| 43409 | -90.911 | 0.172 | 4.313 | 0.028 | 4.77 |
| 43410 | -81.465 | 0.154 | 7.619 | 0.049 | 5.30 |
| 43411 | -84.977 | 0.160 | 7.887 | 0.050 | 5.04 |
| 43412 | -71.293 | 0.135 | 6.099 | 0.039 | 6.25 |
| 43413 | 69.711 | 0.132 | 21.581 | 0.138 | 5.15 |
| 43415 | -70.189 | 0.132 | 6.180 | 0.039 | 6.36 |
| 43416 | -85.355 | 0.161 | 5.926 | 0.038 | 5.09 |
| 43417 | -94.836 | 0.179 | 4.146 | 0.026 | 4.53 |
| 43418 | -95.683 | 0.181 | 10.483 | 0.067 | 4.28 |
| 43419 | -92.766 | 0.175 | 12.631 | 0.081 | 4.34 |
| 43420 | -125.738 | 0.237 | 13.691 | 0.087 | 2.98 |
| 43421 | -130.219 | 0.246 | 20.619 | 0.132 | 2.64 |
| 43424 | -80.524 | 0.152 | 10.230 | 0.065 | 5.24 |
| 43425 | -99.101 | 0.187 | 9.935 | 0.063 | 4.13 |
| 43426 | -110.656 | 0.209 | 6.625 | 0.042 | 3.70 |
| 43427 | -126.843 | 0.239 | 21.542 | 0.138 | 2.70 |
| 43428 | -207.237 | 0.391 | 23.287 | 0.149 | 1.34 |
| 43430 | -109.946 | 0.207 | 34.011 | 0.217 | 2.62 |
| 43432 | -93.052 | 0.176 | 15.467 | 0.099 | 4.18 |
| 43433 | -106.432 | 0.201 | 13.305 | 0.085 | 3.67 |
| 43434 | -98.819 | 0.186 | 14.122 | 0.090 | 3.97 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: POLAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43435 | -51.172 | 0.097 | 70.095 | 0.448 | 1.93 |
| 43438 | -266.263 | 0.502 | 55.636 | 0.355 | 0.50 |
| 43440 | -107.029 | 0.202 | 22.658 | 0.145 | 3.24 |
| 43441 | -123.984 | 0.234 | 13.978 | 0.089 | 3.02 |
| 43442 | -130.972 | 0.247 | 22.173 | 0.142 | 2.57 |
| 43443 | -141.041 | 0.266 | 50.676 | 0.324 | 1.47 |
| 43446 | -187.962 | 0.355 | 35.691 | 0.228 | 1.33 |
| 43450 | -120.649 | 0.228 | 26.627 | 0.170 | 2.67 |
| 43451 | -145.198 | 0.274 | 10.481 | 0.067 | 2.54 |
| 43452 | -172.991 | 0.326 | 28.671 | 0.183 | 1.65 |
| 43453 | -64.615 | 0.122 | 42.797 | 0.273 | 3.44 |
| 43455 | -298.628 | 0.563 | 5.429 | 0.035 | 0.77 |
| 43456 | -291.602 | 0.550 | 12.399 | 0.079 | 0.78 |
| 43457 | 52.763 | 0.100 | 12.951 | 0.083 | 7.90 |
| 43459 | -131.258 | 0.248 | 25.012 | 0.160 | 2.47 |
| 43460 | -159.240 | 0.300 | 12.292 | 0.078 | 2.20 |
| 43461 | -176.126 | 0.332 | 17.834 | 0.114 | 1.82 |
| 43462 | -135.429 | 0.256 | 21.944 | 0.140 | 2.48 |
| 43463 | -218.780 | 0.413 | 6.040 | 0.039 | 1.40 |
| 43464 | -301.995 | 0.570 | 8.887 | 0.057 | 0.73 |
| 43465 | -356.625 | 0.673 | 9.154 | 0.058 | 0.47 |
| 43467 | -138.773 | 0.262 | 17.807 | 0.114 | 2.52 |
| 43468 | -165.154 | 0.312 | 10.984 | 0.070 | 2.11 |
| 43469 | -176.994 | 0.334 | 11.179 | 0.071 | 1.91 |
| 43470 | -211.731 | 0.399 | 10.311 | 0.066 | 1.45 |
| 43471 | -216.522 | 0.409 | 3.801 | 0.024 | 1.44 |
| 43472 | -256.180 | 0.483 | 8.165 | 0.052 | 1.04 |
| 43473 | -191.779 | 0.362 | 9.229 | 0.059 | 1.71 |
| 43474 | -141.278 | 0.267 | 8.785 | 0.056 | 2.66 |
| 43475 | -171.915 | 0.324 | 8.440 | 0.054 | 2.03 |
| 43476 | -194.578 | 0.367 | 8.418 | 0.054 | 1.68 |
| 43477 | -199.449 | 0.376 | 5.857 | 0.037 | 1.64 |
| 43478 | -197.784 | 0.373 | 6.470 | 0.041 | 1.65 |
| 43479 | -182.136 | 0.344 | 16.456 | 0.105 | 1.75 |
| 43480 | -141.086 | 0.266 | 5.016 | 0.032 | 2.72 |
| 43481 | -174.138 | 0.329 | 5.176 | 0.033 | 2.02 |
| 43482 | -182.598 | 0.345 | 5.040 | 0.032 | 1.88 |
| 43483 | -176.418 | 0.333 | 3.955 | 0.025 | 1.99 |
| 43484 | -162.700 | 0.307 | 17.235 | 0.110 | 2.05 |
| 43485 | -133.280 | 0.251 | 5.190 | 0.033 | 2.94 |
| 43486 | -162.147 | 0.306 | 5.197 | 0.033 | 2.24 |
| 43487 | -161.406 | 0.305 | 1.349 | 0.009 | 2.28 |
| 43488 | -136.891 | 0.258 | 12.509 | 0.080 | 2.70 |
| 43489 | -112.917 | 0.213 | 9.007 | 0.058 | 3.55 |
| 43490 | -153.803 | 0.290 | 8.735 | 0.056 | 2.37 |

S.S. 142

S.S.143

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: REGULAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43491 | -100.664 | 0.190 | 2.275 | 0.015 | 4.25 |
| 43492 | -149.092 | 0.281 | 33.329 | 0.213 | 1.87 |
| 43499 | -203.253 | 0.383 | 3.682 | 0.024 | 1.60 |
| 43500 | -16.260 | 0.031 | 0.848 | 0.005 | HIGH |
| 43501 | 50.659 | 0.096 | 1.257 | 0.008 | 9.44 |
| 43502 | 71.124 | 0.134 | 0.704 | 0.004 | 6.45 |
| 43503 | 90.045 | 0.170 | 0.416 | 0.003 | 4.88 |
| 43504 | 122.667 | 0.231 | 4.388 | 0.028 | 3.29 |
| 43505 | 184.371 | 0.348 | 21.895 | 0.140 | 1.63 |
| 43509 | 210.039 | 0.396 | 3.004 | 0.019 | 1.52 |
| 43510 | 161.509 | 0.305 | 3.709 | 0.024 | 2.27 |
| 43511 | 121.871 | 0.230 | 3.438 | 0.022 | 3.33 |
| 43512 | 123.566 | 0.233 | 1.580 | 0.010 | 3.28 |
| 43513 | 129.764 | 0.245 | 0.738 | 0.005 | 3.08 |
| 43514 | 130.503 | 0.246 | 4.129 | 0.026 | 3.03 |
| 43515 | 88.461 | 0.167 | 11.214 | 0.072 | 4.66 |
| 43518 | 307.094 | 0.579 | 15.143 | 0.097 | 0.68 |
| 43519 | 264.300 | 0.499 | 7.621 | 0.049 | 0.99 |
| 43520 | 166.440 | 0.314 | 7.200 | 0.046 | 2.14 |
| 43521 | 161.683 | 0.305 | 5.793 | 0.037 | 2.24 |
| 43522 | 156.839 | 0.296 | 2.293 | 0.015 | 2.37 |
| 43523 | 148.392 | 0.280 | 3.104 | 0.020 | 2.56 |
| 43524 | 118.861 | 0.224 | 3.019 | 0.019 | 3.44 |
| 43526 | 206.865 | 0.390 | 32.092 | 0.205 | 1.21 |
| 43528 | 405.773 | 0.766 | 13.818 | 0.088 | 0.28 |
| 43529 | 229.923 | 0.434 | 13.708 | 0.088 | 1.23 |
| 43530 | 195.193 | 0.368 | 3.925 | 0.025 | 1.70 |
| 43531 | 172.561 | 0.326 | 4.922 | 0.031 | 2.05 |
| 43532 | 139.463 | 0.263 | 4.944 | 0.032 | 2.77 |
| 43534 | 391.044 | 0.738 | 57.952 | 0.370 | 0.09 |
| 43537 | 187.114 | 0.353 | 44.422 | 0.284 | 1.16 |
| 43538 | 196.220 | 0.370 | 8.840 | 0.056 | 1.65 |
| 43539 | 181.387 | 0.342 | 7.917 | 0.051 | 1.88 |
| 43540 | 151.267 | 0.285 | 8.055 | 0.051 | 2.44 |
| 43544 | 220.531 | 0.416 | 37.905 | 0.242 | 1.00 |
| 43547 | 214.558 | 0.405 | 47.550 | 0.304 | 0.69 |
| 43548 | 196.141 | 0.370 | 15.241 | 0.097 | 1.58 |
| 43549 | 176.610 | 0.333 | 10.974 | 0.070 | 1.92 |
| 43550 | 150.909 | 0.285 | 11.402 | 0.073 | 2.39 |
| 43553 | 246.194 | 0.465 | 15.743 | 0.101 | 1.07 |
| 43554 | 253.114 | 0.478 | 10.840 | 0.069 | 1.05 |
| 43556 | 129.174 | 0.244 | 42.310 | 0.270 | 1.90 |
| 43557 | 198.075 | 0.374 | 24.518 | 0.157 | 1.42 |
| 43558 | 170.376 | 0.321 | 11.858 | 0.076 | 2.01 |
| 43559 | 143.073 | 0.270 | 18.745 | 0.120 | 2.40 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: 236V LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43561 | 196.485 | 0.371 | 10.560 | 0.067 | 1.63 |
| 43562 | 205.133 | 0.387 | 10.315 | 0.066 | 1.53 |
| 43563 | 160.080 | 0.302 | 10.268 | 0.066 | 2.22 |
| 43564 | 101.255 | 0.191 | 29.368 | 0.188 | 3.09 |
| 43565 | 160.858 | 0.304 | 21.356 | 0.136 | 1.99 |
| 43566 | 154.025 | 0.291 | 8.538 | 0.055 | 2.37 |
| 43567 | 129.982 | 0.245 | 23.582 | 0.151 | 2.55 |
| 43568 | 102.271 | 0.193 | 8.168 | 0.052 | 4.03 |
| 43569 | 139.214 | 0.263 | 7.404 | 0.047 | 2.74 |
| 43570 | 135.867 | 0.256 | 5.692 | 0.036 | 2.86 |
| 43571 | 138.934 | 0.262 | 13.252 | 0.085 | 2.63 |
| 43572 | 122.911 | 0.232 | 14.541 | 0.093 | 3.04 |
| 43573 | 130.666 | 0.247 | 9.800 | 0.063 | 2.93 |
| 43574 | 114.137 | 0.215 | 22.794 | 0.146 | 3.01 |
| 43575 | 107.663 | 0.203 | 9.525 | 0.061 | 3.75 |
| 43576 | 111.094 | 0.210 | 3.446 | 0.022 | 3.74 |
| 43577 | 120.707 | 0.228 | 7.742 | 0.049 | 3.29 |
| 43578 | 120.019 | 0.226 | 8.049 | 0.051 | 3.31 |
| 43579 | 108.619 | 0.205 | 8.066 | 0.052 | 3.75 |
| 43580 | 95.495 | 0.180 | 17.998 | 0.115 | 3.93 |
| 43581 | 107.035 | 0.202 | 7.863 | 0.050 | 3.82 |
| 43582 | 105.209 | 0.199 | 3.744 | 0.024 | 4.00 |
| 43583 | 106.751 | 0.201 | 4.955 | 0.032 | 3.91 |
| 43584 | 97.442 | 0.184 | 5.031 | 0.032 | 4.37 |
| 43585 | 78.953 | 0.149 | 12.080 | 0.077 | 5.24 |
| 43586 | 109.773 | 0.207 | 4.042 | 0.026 | 3.79 |
| 43587 | 98.385 | 0.186 | 2.672 | 0.017 | 4.36 |
| 43588 | 83.615 | 0.158 | 2.719 | 0.017 | 5.31 |
| 43589 | 68.551 | 0.129 | 6.583 | 0.042 | 6.50 |
| 43590 | 88.589 | 0.167 | 2.839 | 0.018 | 4.95 |
| 43591 | 67.442 | 0.127 | 1.737 | 0.011 | 6.84 |
| 43592 | 53.918 | 0.102 | 4.188 | 0.027 | 8.66 |
| 43594 | 64.870 | 0.122 | 10.806 | 0.069 | 6.59 |
| 52201 | 58.922 | 0.111 | 33.631 | 0.215 | 4.59 |
| 52202 | -381.258 | 0.719 | 40.549 | 0.259 | 0.23 |
| 52204 | 26.929 | 0.051 | 25.484 | 0.163 | 9.81 |
| 52205 | 4.103 | 0.008 | 0.263 | 0.002 | HIGH |
| 52206 | -29.974 | 0.057 | 1.130 | 0.007 | HIGH |
| 52207 | 61.082 | 0.115 | 2.903 | 0.019 | 7.61 |
| 52208 | -43.988 | 0.083 | 2.778 | 0.018 | HIGH |
| 52215 | 33.326 | 0.063 | 46.489 | 0.297 | 4.49 |
| 52216 | -17.753 | 0.033 | 87.178 | 0.557 | 1.55 |
| 52222 | 54.197 | 0.102 | 1.663 | 0.011 | 8.75 |
| 52223 | 78.945 | 0.149 | 7.521 | 0.048 | 5.50 |
| 52224 | -64.160 | 0.121 | 77.942 | 0.498 | 1.40 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: 254J LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52225 | -93.320 | 0.176 | 98.368 | 0.628 | 0.61 |
| 52226 | 148.779 | 0.281 | 3.502 | 0.022 | 2.55 |
| 52227 | -35.300 | 0.067 | 116.249 | 0.742 | 0.51 |
| 52228 | -8.585 | 0.016 | 52.622 | 0.336 | 5.08 |
| 52229 | -10.813 | 0.020 | 17.317 | 0.111 | HIGH |
| 52230 | 15.112 | 0.029 | 8.613 | 0.055 | HIGH |
| 52231 | 37.337 | 0.070 | 12.733 | 0.081 | HIGH |
| 52232 | 49.403 | 0.093 | 9.256 | 0.059 | 8.97 |
| 52233 | 25.266 | 0.048 | 26.034 | 0.166 | 9.99 |
| 52234 | -81.207 | 0.153 | 68.752 | 0.439 | 1.56 |
| 52235 | -75.413 | 0.142 | 133.786 | 0.854 | 0.11 |
| 52236 | 111.664 | 0.211 | 5.710 | 0.036 | 3.68 |
| 52237 | 116.926 | 0.221 | 20.576 | 0.131 | 3.01 |
| 52238 | 14.919 | 0.028 | 39.489 | 0.252 | 7.48 |
| 52239 | 20.463 | 0.039 | 16.279 | 0.104 | HIGH |
| 52240 | 33.683 | 0.064 | 10.253 | 0.065 | HIGH |
| 52241 | -8.256 | 0.016 | 83.549 | 0.534 | 1.87 |
| 52242 | -10.360 | 0.020 | 285.612 | 1.824 | -0.65 |
| 52243 | -0.356 | 0.001 | 1.142 | 0.007 | HIGH |
| 52244 | 11.191 | 0.021 | 293.139 | 1.872 | -0.67 |
| 52245 | -105.640 | 0.199 | 34.441 | 0.220 | 2.70 |
| 52246 | -118.758 | 0.224 | 97.254 | 0.621 | 0.52 |
| 52247 | 140.008 | 0.264 | 27.656 | 0.177 | 2.20 |
| 52248 | 121.038 | 0.228 | 17.008 | 0.109 | 3.02 |
| 52249 | -13.811 | 0.026 | 17.006 | 0.109 | HIGH |
| 52250 | 17.099 | 0.032 | 16.493 | 0.105 | HIGH |
| 52251 | 18.406 | 0.035 | 16.980 | 0.108 | HIGH |
| 52252 | 0.579 | 0.001 | 41.682 | 0.266 | 9.03 |
| 52253 | 1.689 | 0.003 | 37.993 | 0.243 | HIGH |
| 52254 | 5.962 | 0.011 | 149.033 | 0.952 | 0.08 |
| 52255 | -58.943 | 0.111 | 141.766 | 0.905 | 0.05 |
| 52256 | -59.881 | 0.113 | 12.231 | 0.078 | 7.03 |
| 52257 | -110.155 | 0.208 | 22.746 | 0.145 | 3.13 |
| 52258 | -88.154 | 0.166 | 31.628 | 0.202 | 3.40 |
| 52259 | -127.134 | 0.240 | 87.658 | 0.560 | 0.66 |
| 52260 | 85.385 | 0.161 | 6.512 | 0.042 | 5.06 |
| 52261 | 1.891 | 0.004 | 9.014 | 0.058 | HIGH |
| 52262 | -47.770 | 0.090 | 6.051 | 0.039 | 9.70 |
| 52263 | -5.612 | 0.011 | 4.392 | 0.028 | HIGH |
| 52264 | -5.789 | 0.011 | 16.945 | 0.108 | HIGH |
| 52265 | -12.376 | 0.023 | 17.963 | 0.115 | HIGH |
| 52266 | -19.270 | 0.036 | 40.839 | 0.261 | 6.60 |
| 52267 | -35.322 | 0.067 | 70.411 | 0.450 | 2.19 |
| 52268 | -36.941 | 0.070 | 31.723 | 0.203 | 6.64 |
| 52269 | -44.202 | 0.083 | 17.415 | 0.111 | 8.54 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: [illegible]OLAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52270 | 64.164 | 0.121 | 18.857 | 0.120 | 5.86 |
| 52271 | 47.778 | 0.090 | 8.622 | 0.055 | 9.37 |
| 52272 | 61.070 | 0.115 | 12.871 | 0.082 | 6.82 |
| 52273 | 71.597 | 0.135 | 14.913 | 0.095 | 5.60 |
| 52274 | 109.555 | 0.207 | 21.584 | 0.138 | 3.20 |
| 52275 | -304.642 | 0.575 | 51.568 | 0.329 | 0.39 |
| 52278 | -11.924 | 0.022 | 76.943 | 0.491 | 2.22 |
| 52279 | 28.133 | 0.053 | 32.562 | 0.208 | 7.54 |
| 52280 | 46.499 | 0.088 | 17.807 | 0.114 | -8.09 |
| 52281 | 35.777 | 0.068 | 21.390 | 0.137 | 9.18 |
| 52282 | -19.470 | 0.037 | 31.413 | 0.201 | 9.32 |
| 52283 | -29.192 | 0.055 | 89.586 | 0.572 | 1.32 |
| 52286 | -49.959 | 0.094 | 84.705 | 0.541 | 1.30 |
| 52287 | -20.997 | 0.040 | 21.974 | 0.140 | HIGH |
| 52288 | 8.973 | 0.017 | 7.524 | 0.048 | HIGH |
| 52289 | -0.485 | 0.001 | 18.848 | 0.120 | HIGH |
| 52290 | 26.024 | 0.049 | 47.260 | 0.302 | 4.81 |
| 52293 | -19.779 | 0.037 | 19.856 | 0.127 | HIGH |
| 52294 | 6.238 | 0.012 | 10.472 | 0.067 | HIGH |
| 52295 | 12.069 | 0.023 | 4.285 | 0.027 | HIGH |
| 52296 | 20.756 | 0.039 | 32.327 | 0.206 | 8.77 |
| 52297 | -14.078 | 0.027 | 52.478 | 0.335 | 4.74 |
| 52300 | 33.604 | 0.063 | 9.908 | 0.063 | HIGH |
| 52301 | 30.638 | 0.058 | 6.426 | 0.041 | HIGH |
| 52302 | 20.889 | 0.039 | 7.969 | 0.051 | HIGH |
| 52303 | 15.710 | 0.030 | 12.534 | 0.080 | HIGH |
| 52304 | 17.536 | 0.033 | 15.302 | 0.098 | HIGH |
| 52308 | 74.158 | 0.140 | 5.468 | 0.035 | 6.01 |
| 52309 | 44.987 | 0.085 | 4.764 | 0.030 | HIGH |
| 52310 | 43.959 | 0.083 | 4.344 | 0.028 | HIGH |
| 52311 | 30.996 | 0.058 | 14.801 | 0.095 | HIGH |
| 52312 | 12.119 | 0.023 | 0.649 | 0.004 | HIGH |
| 52316 | 74.493 | 0.141 | 2.509 | 0.016 | 6.06 |
| 52317 | 74.693 | 0.141 | 5.886 | 0.038 | 5.94 |
| 52318 | 92.791 | 0.175 | 18.624 | 0.119 | 4.02 |
| 52319 | 15.477 | 0.029 | 13.646 | 0.087 | HIGH |
| 52320 | -7.323 | 0.014 | 7.958 | 0.051 | HIGH |
| 52323 | 79.430 | 0.150 | 16.274 | 0.104 | 4.92 |
| 52324 | 86.311 | 0.163 | 13.940 | 0.089 | 4.64 |
| 52325 | 85.328 | 0.161 | 54.247 | 0.346 | 2.15 |
| 52326 | 87.907 | 0.166 | 150.048 | 0.958 | -0.09 |
| 52327 | -51.992 | 0.098 | 4.631 | 0.030 | 8.98 |
| 52329 | 92.960 | 0.175 | 40.420 | 0.258 | 2.72 |
| 52330 | 100.026 | 0.189 | 51.305 | 0.328 | 2.02 |
| 52331 | 96.028 | 0.181 | 149.712 | 0.956 | -0.10 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: R&J LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52332 | 56.155 | 0.106 | 176.923 | 1.130 | -0.26 |
| 52333 | 50.615 | 0.096 | 20.548 | 0.131 | 7.06 |
| 52334 | 97.379 | 0.184 | 101.245 | 0.647 | 0.54 |
| 52335 | 114.102 | 0.215 | 277.548 | 1.772 | -0.66 |
| 52336 | 15.193 | 0.029 | 0.589 | 0.004 | HIGH |
| 52337 | 165.524 | 0.312 | 294.664 | 1.882 | -0.70 |
| 52338 | 66.737 | 0.126 | 86.978 | 0.555 | 1.07 |
| 52339 | 67.746 | 0.128 | 104.707 | 0.669 | 0.61 |
| 52340 | 133.227 | 0.251 | 29.036 | 0.185 | 2.29 |
| 52341 | 44.615 | 0.084 | 13.050 | 0.083 | 9.30 |
| 52342 | 53.958 | 0.102 | 7.473 | 0.048 | 8.37 |
| 52343 | 8.526 | 0.016 | 20.795 | 0.133 | HIGH |
| 52346 | -15.263 | 0.029 | 0.968 | 0.006 | HIGH |
| 52347 | 7.866 | 0.015 | 2.980 | 0.019 | HIGH |
| 52348 | -11.134 | 0.021 | 70.033 | 0.447 | 2.77 |
| 52349 | -30.743 | 0.058 | 110.151 | 0.703 | 0.67 |
| 52350 | -26.062 | 0.049 | 4.705 | 0.030 | HIGH |
| 52351 | -16.967 | 0.032 | 5.205 | 0.033 | HIGH |
| 52353 | -3.434 | 0.006 | 0.874 | 0.006 | HIGH |
| 52354 | -37.305 | 0.070 | 2.153 | 0.014 | HIGH |
| 52355 | -37.532 | 0.071 | 283.998 | 1.814 | -0.66 |
| 52356 | -7.059 | 0.013 | 0.477 | 0.003 | HIGH |
| 52357 | -27.106 | 0.051 | 172.358 | 1.101 | -0.19 |
| 52358 | -24.265 | 0.046 | 39.290 | 0.251 | 6.42 |
| 52361 | -31.059 | 0.059 | 20.072 | 0.128 | HIGH |
| 52362 | -53.692 | 0.101 | 53.059 | 0.339 | 2.97 |
| 52363 | -51.484 | 0.097 | 69.357 | 0.443 | 1.96 |
| 52364 | -55.471 | 0.105 | 64.585 | 0.412 | 2.16 |
| 52365 | -37.750 | 0.071 | 109.570 | 0.700 | 0.65 |
| 52368 | -51.171 | 0.097 | 1.784 | 0.011 | 9.32 |
| 52369 | -85.142 | 0.161 | 1.033 | 0.007 | 5.22 |
| 52370 | -64.452 | 0.122 | 85.664 | 0.547 | 1.13 |
| 52371 | -65.412 | 0.123 | 38.991 | 0.249 | 3.74 |
| 52372 | -56.798 | 0.107 | 75.600 | 0.483 | 1.59 |
| 52375 | -84.211 | 0.159 | 19.103 | 0.122 | 4.43 |
| 52376 | -81.132 | 0.153 | 8.176 | 0.052 | 5.30 |
| 52377 | -94.072 | 0.177 | 12.460 | 0.080 | 4.28 |
| 52378 | -76.300 | 0.144 | 16.290 | 0.104 | 5.13 |
| 52379 | -68.123 | 0.129 | 21.004 | 0.134 | 5.32 |
| 52383 | -44.395 | 0.084 | 66.646 | 0.426 | 2.25 |
| 52384 | -70.548 | 0.133 | 24.731 | 0.158 | 4.79 |
| 52385 | -76.331 | 0.144 | 5.292 | 0.034 | 5.82 |
| 52386 | -77.755 | 0.147 | 2.797 | 0.018 | 5.78 |
| 52387 | -76.237 | 0.144 | 1.730 | 0.011 | 5.93 |
| 52390 | -144.760 | 0.273 | 48.703 | 0.311 | 1.48 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: REGULAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52391 | -100.888 | 0.190 | 60.632 | 0.387 | 1.63 |
| 52392 | -57.709 | 0.109 | 38.948 | 0.249 | 4.09 |
| 52393 | -45.674 | 0.086 | 7.620 | 0.049 | 9.96 |
| 52394 | -59.129 | 0.112 | 4.392 | 0.028 | 7.81 |
| 52396 | -519.021 | 0.979 | 53.898 | 0.344 | -0.12 |
| 52397 | 10.246 | 0.019 | 31.141 | 0.199 | HIGH |
| 52398 | 15.153 | 0.029 | 29.720 | 0.190 | HIGH |
| 52399 | -6.931 | 0.013 | 17.314 | 0.111 | HIGH |
| 52400 | -55.108 | 0.104 | 8.401 | 0.054 | 8.09 |
| 52401 | -353.358 | 0.667 | 67.402 | 0.430 | 0.12 |
| 52402 | -260.638 | 0.492 | 89.996 | 0.575 | 0.15 |
| 52403 | 17.653 | 0.033 | 19.583 | 0.125 | HIGH |
| 52404 | 26.112 | 0.049 | 25.997 | 0.166 | 9.82 |
| 52405 | -36.700 | 0.069 | 25.362 | 0.162 | 8.04 |
| 52406 | -231.144 | 0.436 | 72.455 | 0.463 | 0.44 |
| 52407 | -232.684 | 0.439 | 72.250 | 0.461 | 0.43 |
| 52408 | -18.705 | 0.035 | 27.084 | 0.173 | HIGH |
| 52409 | 7.012 | 0.013 | 51.162 | 0.327 | 5.48 |
| 52410 | -162.347 | 0.306 | 46.232 | 0.295 | 1.36 |
| 52411 | -149.957 | 0.283 | 35.327 | 0.226 | 1.80 |
| 52412 | -105.901 | 0.200 | 45.877 | 0.293 | 2.16 |
| 52413 | -94.416 | 0.178 | 25.028 | 0.160 | 3.58 |
| 52414 | -110.663 | 0.209 | 39.135 | 0.250 | 2.37 |
| 52415 | -17.480 | 0.033 | 10.649 | 0.068 | HIGH |
| 52425 | 25.237 | 0.048 | 40.182 | 0.257 | 6.14 |
| 52426 | 39.225 | 0.074 | 30.880 | 0.197 | 6.56 |
| 52427 | 110.342 | 0.208 | 28.139 | 0.180 | 2.88 |
| 52443 | 121.933 | 0.230 | 123.796 | 0.791 | 0.12 |
| 52444 | 82.983 | 0.157 | 21.457 | 0.137 | 4.34 |
| 52445 | 33.612 | 0.063 | 31.613 | 0.202 | 7.05 |
| 52446 | 108.332 | 0.204 | 56.406 | 0.360 | 1.69 |
| 52447 | -111.867 | 0.211 | 263.469 | 1.682 | -0.63 |
| 52463 | -299.198 | 0.565 | 292.359 | 1.867 | -0.72 |
| 52464 | 331.954 | 0.626 | 24.719 | 0.158 | 0.50 |
| 52465 | -99.055 | 0.187 | 26.421 | 0.169 | 3.32 |
| 53301 | 250.839 | 0.473 | 7.710 | 0.049 | 1.09 |
| 53302 | -62.592 | 0.118 | 10.399 | 0.066 | 6.89 |
| 53303 | -67.699 | 0.128 | 14.750 | 0.094 | 5.96 |
| 53304 | 208.938 | 0.394 | 4.529 | 0.029 | 1.52 |
| 53305 | 93.089 | 0.176 | 6.203 | 0.040 | 4.58 |
| 53306 | -43.317 | 0.082 | 16.537 | 0.106 | 8.87 |
| 53307 | 124.643 | 0.235 | 5.492 | 0.035 | 3.20 |
| 53308 | -75.895 | 0.143 | 12.369 | 0.079 | 5.45 |
| 53313 | 171.283 | 0.323 | 6.262 | 0.040 | 2.06 |
| 53314 | 228.972 | 0.432 | 9.184 | 0.059 | 1.28 |

BM'S'S

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: REGULAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53319 | 116.153 | 0.219 | 8.165 | 0.052 | 3.45 |
| 53320 | 106.745 | 0.201 | 11.966 | 0.076 | 3.71 |
| 53321 | 197.362 | 0.372 | 10.491 | 0.067 | 1.62 |
| 53322 | 199.315 | 0.376 | 6.705 | 0.043 | 1.63 |
| 53323 | 130.495 | 0.246 | 9.293 | 0.059 | 2.85 |
| 53324 | 181.958 | 0.343 | 13.224 | 0.084 | 1.80 |
| 53327 | 164.986 | 0.311 | 16.042 | 0.102 | 2.03 |
| 53328 | 98.960 | 0.187 | 11.270 | 0.072 | 4.08 |
| 53329 | 120.482 | 0.227 | 7.334 | 0.047 | 3.31 |
| 53330 | 129.784 | 0.245 | 19.731 | 0.126 | 2.68 |
| 53331 | 179.876 | 0.339 | 12.909 | 0.082 | 1.84 |
| 53332 | 160.142 | 0.302 | 4.893 | 0.031 | 2.28 |
| 53333 | 167.543 | 0.316 | 11.590 | 0.074 | 2.06 |
| 53334 | 171.379 | 0.323 | 34.199 | 0.218 | 1.54 |
| 53338 | 118.880 | 0.224 | 39.982 | 0.255 | 2.16 |
| 53339 | 114.541 | 0.216 | 14.194 | 0.091 | 3.33 |
| 53340 | 97.405 | 0.184 | 8.913 | 0.057 | 4.25 |
| 53341 | 116.430 | 0.220 | 20.338 | 0.130 | 3.04 |
| 53342 | 150.482 | 0.284 | 9.408 | 0.060 | 2.43 |
| 53343 | 123.877 | 0.234 | 8.470 | 0.054 | 3.17 |
| 53344 | 117.942 | 0.223 | 15.424 | 0.098 | 3.17 |
| 53345 | 139.626 | 0.263 | 37.234 | 0.238 | 1.90 |
| 53350 | 85.650 | 0.162 | 45.239 | 0.289 | 2.63 |
| 53351 | 65.710 | 0.124 | 17.857 | 0.114 | 5.83 |
| 53352 | 69.460 | 0.131 | 12.856 | 0.082 | 5.96 |
| 53353 | 99.952 | 0.189 | 14.314 | 0.091 | 3.91 |
| 53354 | 116.001 | 0.219 | 7.794 | 0.050 | 3.46 |
| 53355 | 104.469 | 0.197 | 8.710 | 0.056 | 3.91 |
| 53356 | 99.685 | 0.188 | 5.668 | 0.036 | 4.23 |
| 53357 | 81.264 | 0.153 | 33.950 | 0.217 | 3.50 |
| 53363 | 36.792 | 0.069 | 39.208 | 0.250 | 5.33 |
| 53364 | 48.239 | 0.091 | 6.744 | 0.043 | 9.52 |
| 53365 | 55.957 | 0.106 | 11.439 | 0.073 | 7.63 |
| 53366 | 84.676 | 0.160 | 10.470 | 0.067 | 4.93 |
| 53367 | 76.188 | 0.144 | 18.287 | 0.117 | 4.99 |
| 53368 | 99.266 | 0.187 | 7.749 | 0.049 | 4.20 |
| 53369 | 97.432 | 0.184 | 4.118 | 0.026 | 4.39 |
| 53370 | 89.801 | 0.169 | 7.452 | 0.048 | 4.74 |
| 53371 | 54.236 | 0.102 | 35.734 | 0.228 | 4.63 |
| 53376 | 16.585 | 0.031 | 38.427 | 0.245 | 7.56 |
| 53377 | 38.913 | 0.073 | 8.824 | 0.056 | HIGH |
| 53378 | 41.532 | 0.078 | 6.093 | 0.039 | HIGH |
| 53379 | 45.768 | 0.086 | 6.278 | 0.040 | HIGH |
| 53380 | 67.782 | 0.128 | 6.047 | 0.039 | 6.62 |
| 53382 | 115.794 | 0.218 | 10.412 | 0.066 | 3.40 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: REGULAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53383 | 93.181 | 0.176 | 0.957 | 0.006 | 4.68 |
| 53384 | 79.324 | 0.150 | 1.827 | 0.012 | 5.66 |
| 53385 | 68.223 | 0.129 | 2.153 | 0.014 | 6.74 |
| 53386 | 96.261 | 0.182 | 24.749 | 0.158 | 3.52 |
| 53390 | 67.029 | 0.126 | 25.983 | 0.166 | 4.90 |
| 53391 | 28.758 | 0.054 | 2.482 | 0.016 | HIGH |
| 53392 | 28.646 | 0.054 | 2.640 | 0.017 | HIGH |
| 53393 | 26.892 | 0.051 | 2.420 | 0.015 | HIGH |
| 53394 | 30.984 | 0.058 | 1.772 | 0.011 | HIGH |
| 53395 | 43.519 | 0.082 | 1.365 | 0.009 | HIGH |
| 53397 | 139.036 | 0.262 | 26.515 | 0.169 | 2.26 |
| 53398 | 94.522 | 0.178 | 1.954 | 0.012 | 4.59 |
| 53399 | 75.603 | 0.143 | 3.090 | 0.020 | 5.96 |
| 53400 | 67.843 | 0.128 | 5.131 | 0.033 | 6.66 |
| 53401 | 53.450 | 0.101 | 6.102 | 0.039 | 8.59 |
| 53402 | 23.910 | 0.045 | 5.840 | 0.037 | HIGH |
| 53403 | -67.425 | 0.127 | 11.065 | 0.071 | 6.30 |
| 53406 | 63.987 | 0.121 | 16.139 | 0.103 | 6.17 |
| 53407 | 97.047 | 0.183 | 10.318 | 0.066 | 4.22 |
| 53408 | 98.934 | 0.187 | 4.112 | 0.026 | 4.31 |
| 53409 | 103.743 | 0.196 | 9.244 | 0.059 | 3.93 |
| 53410 | 109.698 | 0.207 | 11.528 | 0.074 | 3.60 |
| 53411 | 102.388 | 0.193 | 11.456 | 0.073 | 3.91 |
| 53412 | 153.063 | 0.289 | 12.125 | 0.077 | 2.33 |
| 53413 | 181.677 | 0.343 | 34.618 | 0.221 | 1.42 |
| 53415 | 76.753 | 0.145 | 14.019 | 0.090 | 5.27 |
| 53416 | 102.766 | 0.194 | 13.713 | 0.088 | 3.81 |
| 53417 | 110.441 | 0.208 | 11.371 | 0.073 | 3.58 |
| 53418 | 128.819 | 0.243 | 13.670 | 0.087 | 2.89 |
| 53419 | 107.251 | 0.202 | 14.272 | 0.091 | 3.60 |
| 53420 | 20.175 | 0.038 | 19.008 | 0.121 | HIGH |
| 53421 | -36.694 | 0.069 | 7.880 | 0.050 | HIGH |
| 53424 | 91.250 | 0.172 | 21.062 | 0.134 | 3.95 |
| 53425 | 115.447 | 0.218 | 17.835 | 0.114 | 3.16 |
| 53426 | 150.884 | 0.285 | 21.315 | 0.136 | 2.17 |
| 53432 | 74.072 | 0.140 | 42.078 | 0.269 | 3.17 |
| 53433 | 70.274 | 0.133 | 42.490 | 0.271 | 3.26 |
| 53440 | 74.541 | 0.141 | 89.423 | 0.571 | 0.94 |
| 53450 | 121.235 | 0.229 | 90.945 | 0.581 | 0.63 |
| 53455 | -125.509 | 0.237 | 46.358 | 0.296 | 1.81 |
| 53456 | 2.317 | 0.004 | 27.475 | 0.175 | HIGH |
| 53457 | 60.285 | 0.114 | 41.655 | 0.266 | 3.71 |
| 53463 | -164.270 | 0.310 | 21.604 | 0.138 | 1.93 |
| 53464 | -104.700 | 0.198 | 18.238 | 0.116 | 3.53 |
| 53465 | -118.330 | 0.223 | 20.732 | 0.132 | 2.96 |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: POLAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53467 | -69.980 | 0.132 | 63.114 | 0.403 | 1.98 |
| 53470 | -159.685 | 0.301 | 22.815 | 0.146 | 1.98 |
| 53471 | -139.852 | 0.264 | 21.862 | 0.140 | 2.38 |
| 53472 | -122.694 | 0.231 | 14.711 | 0.094 | 3.04 |
| 53473 | -108.870 | 0.205 | 18.259 | 0.117 | 3.37 |
| 53474 | -84.731 | 0.160 | 49.190 | 0.314 | 2.43 |
| 53475 | -79.066 | 0.149 | 18.414 | 0.118 | 4.79 |
| 53476 | -101.137 | 0.191 | 17.838 | 0.114 | 3.69 |
| 53477 | -112.403 | 0.212 | 17.624 | 0.113 | 3.27 |
| 53478 | -116.007 | 0.219 | 7.953 | 0.051 | 3.46 |
| 53479 | -111.954 | 0.211 | 29.531 | 0.189 | 2.77 |
| 53480 | -78.912 | 0.149 | 30.792 | 0.197 | 3.83 |
| 53481 | -88.554 | 0.167 | 15.490 | 0.099 | 4.42 |
| 53482 | -91.005 | 0.172 | 14.662 | 0.094 | 4.33 |
| 53483 | -98.543 | 0.186 | 10.808 | 0.069 | 4.12 |
| 53484 | -107.192 | 0.202 | 27.986 | 0.179 | 2.98 |
| 53485 | -70.661 | 0.133 | 15.097 | 0.096 | 5.67 |
| 53486 | -76.383 | 0.144 | 9.386 | 0.060 | 5.61 |
| 53487 | -80.437 | 0.152 | 9.238 | 0.059 | 5.30 |
| 53488 | -90.374 | 0.171 | 19.183 | 0.122 | 4.11 |
| 53489 | -53.904 | 0.102 | 4.253 | 0.027 | 8.66 |
| 53490 | -62.245 | 0.117 | 4.296 | 0.027 | 7.38 |
| 53491 | -69.345 | 0.131 | 9.546 | 0.061 | 6.23 |
| 53492 | -41.907 | 0.079 | 1.187 | 0.008 | HIGH |
| 53493 | -46.673 | 0.088 | 3.734 | 0.024 | HIGH |
| 53494 | -14.592 | 0.028 | 1.548 | 0.010 | HIGH |
| 53499 | -46.546 | 0.088 | 11.390 | 0.073 | 9.20 |
| 53500 | -1.893 | 0.004 | 4.962 | 0.032 | HIGH |
| 53501 | 14.318 | 0.027 | 5.835 | 0.037 | HIGH |
| 53502 | 22.992 | 0.043 | 4.783 | 0.031 | HIGH |
| 53503 | 19.970 | 0.038 | 2.263 | 0.014 | HIGH |
| 53504 | 15.187 | 0.029 | 2.096 | 0.013 | HIGH |
| 53505 | 11.166 | 0.021 | 2.355 | 0.015 | HIGH |
| 53506 | 7.068 | 0.013 | 1.473 | 0.009 | HIGH |
| 53509 | 44.887 | 0.085 | 12.178 | 0.078 | 9.40 |
| 53510 | 34.183 | 0.064 | 11.523 | 0.074 | HIGH |
| 53511 | 51.214 | 0.097 | 11.549 | 0.074 | 8.34 |
| 53512 | 47.482 | 0.090 | 8.648 | 0.055 | 9.43 |
| 53513 | 39.816 | 0.075 | 4.711 | 0.030 | HIGH |
| 53514 | 35.624 | 0.067 | 6.291 | 0.040 | HIGH |
| 53515 | 25.822 | 0.049 | 6.345 | 0.041 | HIGH |
| 53518 | -136.021 | 0.257 | 6.094 | 0.039 | 2.85 |
| 53519 | -29.427 | 0.056 | 19.636 | 0.125 | HIGH |
| 53520 | 55.237 | 0.104 | 15.379 | 0.098 | 7.23 |
| 53521 | 75.117 | 0.142 | 14.397 | 0.092 | 5.37 |

151'S'S

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: R&GU LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53522 | 63.759 | 0.120 | 11.170 | 0.071 | 6.68 |
| 53523 | 61.177 | 0.115 | 13.181 | 0.084 | 6.78 |
| 53524 | 54.569 | 0.103 | 13.595 | 0.087 | 7.56 |
| 53530 | 108.827 | 0.205 | 23.195 | 0.148 | 3.15 |
| 53531 | 86.676 | 0.164 | 18.335 | 0.117 | 4.35 |
| 53532 | 76.822 | 0.145 | 21.832 | 0.139 | 4.66 |
| 53539 | 72.470 | 0.137 | 44.490 | 0.284 | 3.04 |
| 53540 | 86.567 | 0.163 | 43.383 | 0.277 | 2.72 |
| 53550 | 112.041 | 0.211 | 91.437 | 0.584 | 0.66 |
| 53553 | 28.677 | 0.054 | 23.863 | 0.152 | 9.96 |
| 53554 | -68.007 | 0.128 | 43.251 | 0.276 | 3.28 |
| 53559 | 141.748 | 0.267 | 96.334 | 0.615 | 0.44 |
| 53561 | -160.325 | 0.303 | 18.377 | 0.117 | 2.07 |
| 53562 | -109.355 | 0.206 | 16.967 | 0.108 | 3.41 |
| 53563 | -170.332 | 0.321 | 20.379 | 0.130 | 1.86 |
| 53568 | -126.634 | 0.239 | 14.266 | 0.091 | 2.94 |
| 53569 | -160.994 | 0.304 | 10.893 | 0.070 | 2.19 |
| 53570 | -168.300 | 0.318 | 19.331 | 0.123 | 1.91 |
| 53571 | -189.662 | 0.358 | 19.915 | 0.127 | 1.60 |
| 53574 | -65.069 | 0.123 | 61.014 | 0.390 | 2.18 |
| 53575 | -145.641 | 0.275 | 19.296 | 0.123 | 2.33 |
| 53576 | -158.029 | 0.298 | 8.417 | 0.054 | 2.29 |
| 53577 | -152.048 | 0.287 | 15.445 | 0.099 | 2.29 |
| 53578 | -133.622 | 0.252 | 15.635 | 0.100 | 2.71 |
| 53579 | -98.164 | 0.185 | 16.916 | 0.108 | 3.86 |
| 53580 | -94.750 | 0.179 | 48.242 | 0.308 | 2.27 |
| 53581 | -139.855 | 0.264 | 16.065 | 0.103 | 2.54 |
| 53582 | -143.177 | 0.270 | 10.326 | 0.066 | 2.59 |
| 53583 | -138.320 | 0.261 | 12.555 | 0.080 | 2.66 |
| 53584 | -130.623 | 0.246 | 13.541 | 0.086 | 2.84 |
| 53585 | -107.153 | 0.202 | 30.254 | 0.193 | 2.87 |
| 53586 | -117.201 | 0.221 | 8.633 | 0.055 | 3.40 |
| 53587 | -130.134 | 0.246 | 6.173 | 0.039 | 3.02 |
| 53588 | -128.194 | 0.242 | 6.540 | 0.042 | 3.07 |
| 53589 | -103.385 | 0.195 | 14.753 | 0.094 | 3.74 |
| 53590 | -82.469 | 0.156 | 2.817 | 0.018 | 5.39 |
| 53591 | -122.277 | 0.231 | 4.830 | 0.031 | 3.29 |
| 53592 | -90.390 | 0.171 | 5.646 | 0.036 | 4.76 |
| 53594 | -92.797 | 0.175 | 24.962 | 0.159 | 3.64 |
| 62201 | -111.290 | 0.210 | 6.801 | 0.043 | 3.67 |
| 62202 | 84.390 | 0.159 | 2.032 | 0.013 | 5.26 |
| 62203 | 87.079 | 0.164 | 0.919 | 0.006 | 5.08 |
| 62204 | 100.978 | 0.191 | 0.990 | 0.006 | 4.24 |
| 62205 | -42.346 | 0.080 | 2.959 | 0.019 | HIGH |
| 62206 | 3.392 | 0.006 | 2.851 | 0.018 | HIGH |

55.152

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: R2GU LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62207 | -61.027 | 0.115 | 5.936 | 0.038 | 7.45 |
| 62208 | 7.208 | 0.014 | 5.559 | 0.035 | HIGH |
| 62215 | -169.217 | 0.319 | 7.174 | 0.046 | 2.09 |
| 62216 | -125.705 | 0.237 | 1.294 | 0.008 | 3.21 |
| 62222 | -53.749 | 0.101 | 2.522 | 0.016 | 8.79 |
| 62223 | -43.441 | 0.082 | 7.045 | 0.045 | HIGH |
| 62224 | -148.632 | 0.280 | 22.749 | 0.145 | 2.18 |
| 62225 | -147.387 | 0.278 | 3.265 | 0.021 | 2.58 |
| 62226 | -102.589 | 0.194 | 2.781 | 0.018 | 4.14 |
| 62227 | -64.975 | 0.123 | 0.503 | 0.003 | 7.15 |
| 62228 | -38.888 | 0.073 | 1.136 | 0.007 | HIGH |
| 62229 | -29.157 | 0.055 | 3.493 | 0.022 | HIGH |
| 62230 | -30.386 | 0.057 | 1.954 | 0.012 | HIGH |
| 62231 | -35.447 | 0.067 | 3.904 | 0.025 | HIGH |
| 62232 | -45.453 | 0.086 | 1.661 | 0.011 | HIGH |
| 62233 | -40.852 | 0.077 | 5.154 | 0.033 | HIGH |
| 62234 | -127.797 | 0.241 | 18.023 | 0.115 | 2.79 |
| 62235 | -71.503 | 0.135 | 10.239 | 0.065 | 5.98 |
| 62236 | -88.263 | 0.167 | 5.757 | 0.037 | 4.90 |
| 62237 | -70.661 | 0.133 | 0.748 | 0.005 | 6.50 |
| 62238 | -50.480 | 0.095 | 2.650 | 0.017 | 9.41 |
| 62239 | -30.508 | 0.058 | 1.946 | 0.012 | HIGH |
| 62240 | -26.793 | 0.051 | 1.121 | 0.007 | HIGH |
| 62241 | -30.210 | 0.057 | 11.391 | 0.073 | HIGH |
| 62242 | -36.457 | 0.069 | 10.965 | 0.070 | HIGH |
| 62243 | -36.828 | 0.069 | 12.703 | 0.081 | HIGH |
| 62244 | -31.907 | 0.060 | 21.589 | 0.138 | 9.94 |
| 62245 | -36.466 | 0.069 | 47.104 | 0.301 | 4.24 |
| 62246 | -47.365 | 0.089 | 10.411 | 0.066 | 9.20 |
| 62247 | -54.379 | 0.103 | 14.177 | 0.091 | 7.51 |
| 62248 | -57.853 | 0.109 | 2.229 | 0.014 | 8.11 |
| 62249 | -44.313 | 0.084 | 1.685 | 0.011 | HIGH |
| 62250 | -30.621 | 0.058 | 2.076 | 0.013 | HIGH |
| 62251 | -22.465 | 0.042 | 2.288 | 0.015 | HIGH |
| 62252 | -24.070 | 0.045 | 2.571 | 0.016 | HIGH |
| 62253 | -27.672 | 0.052 | 25.325 | 0.162 | 9.70 |
| 62254 | -22.914 | 0.043 | 8.490 | 0.054 | HIGH |
| 62255 | -30.427 | 0.057 | 2.798 | 0.018 | HIGH |
| 62256 | -35.372 | 0.067 | 3.447 | 0.022 | HIGH |
| 62257 | -31.818 | 0.060 | 75.201 | 0.480 | 1.97 |
| 62258 | -16.463 | 0.031 | 43.561 | 0.278 | 6.27 |
| 62259 | -56.429 | 0.106 | 27.890 | 0.178 | 5.44 |
| 62260 | -28.724 | 0.054 | 3.073 | 0.020 | HIGH |
| 62261 | -28.758 | 0.054 | 2.478 | 0.016 | HIGH |
| 62262 | -19.700 | 0.037 | 2.626 | 0.017 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: POLAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62263 | -16.498 | 0.031 | 0.757 | 0.005 | HIGH |
| 62264 | -12.759 | 0.024 | 3.715 | 0.024 | HIGH |
| 62265 | -23.830 | 0.045 | 4.558 | 0.029 | HIGH |
| 62266 | -17.757 | 0.034 | 7.695 | 0.049 | HIGH |
| 62267 | -14.088 | 0.027 | 1.874 | 0.012 | HIGH |
| 62268 | -25.860 | 0.049 | 1.432 | 0.009 | HIGH |
| 62269 | -27.404 | 0.052 | 1.404 | 0.009 | HIGH |
| 62270 | 31.852 | 0.060 | 10.598 | 0.068 | HIGH |
| 62271 | -2.259 | 0.004 | 101.933 | 0.651 | 1.10 |
| 62272 | 24.456 | 0.046 | 16.890 | 0.108 | HIGH |
| 62273 | 11.143 | 0.021 | 2.306 | 0.015 | HIGH |
| 62274 | 25.538 | 0.048 | 8.151 | 0.052 | HIGH |
| 62275 | 92.975 | 0.175 | 5.246 | 0.033 | 4.62 |
| 62278 | 16.524 | 0.031 | 35.250 | 0.225 | 8.55 |
| 62279 | 7.939 | 0.015 | 67.805 | 0.433 | 3.06 |
| 62280 | 5.061 | 0.010 | 5.633 | 0.036 | HIGH |
| 62281 | 21.501 | 0.041 | 5.778 | 0.037 | HIGH |
| 62282 | -30.233 | 0.057 | 5.234 | 0.033 | HIGH |
| 62283 | 11.996 | 0.023 | 1.592 | 0.010 | HIGH |
| 62286 | 4.197 | 0.008 | 28.670 | 0.183 | HIGH |
| 62287 | 2.389 | 0.005 | 20.813 | 0.133 | HIGH |
| 62288 | 5.753 | 0.011 | 3.804 | 0.024 | HIGH |
| 62289 | -11.920 | 0.022 | 4.141 | 0.026 | HIGH |
| 62290 | -49.979 | 0.094 | 3.854 | 0.025 | 9.44 |
| 62293 | 7.364 | 0.014 | 11.089 | 0.071 | HIGH |
| 62294 | 6.473 | 0.012 | 10.852 | 0.069 | HIGH |
| 62295 | -7.097 | 0.013 | 3.256 | 0.021 | HIGH |
| 62296 | -27.212 | 0.051 | 3.608 | 0.023 | HIGH |
| 62297 | -58.368 | 0.110 | 3.376 | 0.022 | 7.98 |
| 62300 | 5.506 | 0.010 | 9.442 | 0.060 | HIGH |
| 62301 | -4.468 | 0.008 | 7.296 | 0.047 | HIGH |
| 62302 | -18.119 | 0.034 | 5.843 | 0.037 | HIGH |
| 62303 | -29.851 | 0.056 | 5.469 | 0.035 | HIGH |
| 62304 | -43.381 | 0.082 | 7.477 | 0.048 | HIGH |
| 62308 | -5.235 | 0.010 | 14.027 | 0.090 | HIGH |
| 62309 | -8.001 | 0.015 | 2.718 | 0.017 | HIGH |
| 62310 | -16.569 | 0.031 | 5.897 | 0.038 | HIGH |
| 62311 | -23.394 | 0.044 | 4.724 | 0.030 | HIGH |
| 62312 | -20.617 | 0.039 | 6.067 | 0.039 | HIGH |
| 62316 | -3.477 | 0.007 | 16.963 | 0.108 | HIGH |
| 62317 | -10.184 | 0.019 | 4.881 | 0.031 | HIGH |
| 62318 | -8.482 | 0.016 | 8.414 | 0.054 | HIGH |
| 62319 | -4.970 | 0.009 | 8.623 | 0.055 | HIGH |
| 62320 | -1.412 | 0.003 | 2.900 | 0.019 | HIGH |
| 62323 | -3.353 | 0.006 | 18.005 | 0.115 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: [illegible]LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62324 | 7.143 | 0.013 | 10.277 | 0.066 | HIGH |
| 62325 | 10.977 | 0.021 | 12.840 | 0.082 | HIGH |
| 62326 | 16.849 | 0.032 | 8.596 | 0.055 | HIGH |
| 62327 | 22.570 | 0.043 | 6.047 | 0.039 | HIGH |
| 62329 | 36.526 | 0.069 | 38.534 | 0.246 | 5.46 |
| 62330 | 29.023 | 0.055 | 41.595 | 0.266 | 5.53 |
| 62331 | 23.541 | 0.044 | 9.302 | 0.059 | HIGH |
| 62332 | 32.124 | 0.061 | 7.606 | 0.049 | HIGH |
| 62333 | 29.444 | 0.056 | 12.458 | 0.080 | HIGH |
| 62334 | 38.891 | 0.073 | 34.070 | 0.218 | 6.01 |
| 62335 | 34.571 | 0.065 | 7.810 | 0.050 | HIGH |
| 62336 | 19.324 | 0.036 | 1.852 | 0.012 | HIGH |
| 62337 | 44.136 | 0.083 | 27.144 | 0.173 | 6.70 |
| 62338 | 16.951 | 0.032 | 17.011 | 0.109 | HIGH |
| 62339 | 28.626 | 0.054 | 5.286 | 0.034 | HIGH |
| 62340 | 37.227 | 0.070 | 7.235 | 0.046 | HIGH |
| 62341 | 31.485 | 0.059 | 12.889 | 0.082 | HIGH |
| 62342 | 34.181 | 0.064 | 3.766 | 0.024 | HIGH |
| 62343 | 16.425 | 0.031 | 5.897 | 0.038 | HIGH |
| 62346 | 26.088 | 0.049 | 3.952 | 0.025 | HIGH |
| 62347 | -9.375 | 0.018 | 2.044 | 0.013 | HIGH |
| 62348 | -8.559 | 0.016 | 18.684 | 0.119 | HIGH |
| 62349 | -6.535 | 0.012 | 10.171 | 0.065 | HIGH |
| 62350 | -3.929 | 0.007 | 4.818 | 0.031 | HIGH |
| 62351 | -0.450 | 0.001 | 5.449 | 0.035 | HIGH |
| 62353 | -12.190 | 0.023 | 8.240 | 0.053 | HIGH |
| 62354 | -25.127 | 0.047 | 7.529 | 0.048 | HIGH |
| 62355 | -12.273 | 0.023 | 4.523 | 0.029 | HIGH |
| 62356 | -10.103 | 0.019 | 10.777 | 0.069 | HIGH |
| 62357 | -3.162 | 0.006 | 6.070 | 0.039 | HIGH |
| 62358 | 9.605 | 0.018 | 12.473 | 0.080 | HIGH |
| 62361 | -13.957 | 0.026 | 8.483 | 0.054 | HIGH |
| 62362 | -8.160 | 0.015 | 8.450 | 0.054 | HIGH |
| 62363 | 0.681 | 0.001 | 10.595 | 0.068 | HIGH |
| 62364 | -7.454 | 0.014 | 29.025 | 0.185 | HIGH |
| 62365 | -10.531 | 0.020 | 18.048 | 0.115 | HIGH |
| 62368 | 6.637 | 0.013 | 6.875 | 0.044 | HIGH |
| 62369 | 7.046 | 0.013 | 4.354 | 0.028 | HIGH |
| 62370 | 10.448 | 0.020 | 6.351 | 0.041 | HIGH |
| 62371 | 14.030 | 0.026 | 10.260 | 0.066 | HIGH |
| 62372 | 9.045 | 0.017 | 29.803 | 0.190 | HIGH |
| 62375 | 38.415 | 0.072 | 5.288 | 0.034 | HIGH |
| 62376 | 22.702 | 0.043 | 2.780 | 0.018 | HIGH |
| 62377 | 22.032 | 0.042 | 5.426 | 0.035 | HIGH |
| 62378 | 23.708 | 0.045 | 5.649 | 0.036 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: R&O LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62379 | 36.279 | 0.068 | 35.107 | 0.224 | 6.07 |
| 62383 | 73.097 | 0.138 | 1.540 | 0.010 | 6.23 |
| 62384 | 46.454 | 0.088 | 1.258 | 0.008 | HIGH |
| 62385 | 30.291 | 0.057 | 5.783 | 0.037 | HIGH |
| 62386 | 18.960 | 0.036 | 1.073 | 0.007 | HIGH |
| 62387 | 16.098 | 0.030 | 21.347 | 0.136 | HIGH |
| 62390 | 88.508 | 0.167 | 1.225 | 0.008 | 4.98 |
| 62391 | 58.123 | 0.110 | 1.624 | 0.010 | 8.09 |
| 62392 | 38.197 | 0.072 | 1.262 | 0.008 | HIGH |
| 62393 | 24.777 | 0.047 | 1.287 | 0.008 | HIGH |
| 62394 | 9.632 | 0.018 | 15.764 | 0.101 | HIGH |
| 62396 | 82.523 | 0.156 | 5.047 | 0.032 | 5.32 |
| 62397 | 50.723 | 0.096 | 4.735 | 0.030 | 9.21 |
| 62398 | 33.558 | 0.063 | 4.883 | 0.031 | HIGH |
| 62399 | 20.367 | 0.038 | 2.557 | 0.016 | HIGH |
| 62400 | 11.645 | 0.022 | 10.732 | 0.069 | HIGH |
| 62401 | 7.196 | 0.014 | 12.070 | 0.077 | HIGH |
| 62402 | -10.114 | 0.019 | 6.539 | 0.042 | HIGH |
| 62403 | 7.129 | 0.013 | 13.955 | 0.089 | HIGH |
| 62404 | 11.028 | 0.021 | 12.160 | 0.078 | HIGH |
| 62405 | 12.130 | 0.023 | 3.442 | 0.022 | HIGH |
| 62406 | -85.344 | 0.161 | 24.700 | 0.158 | 3.99 |
| 62407 | -1.388 | 0.003 | 22.086 | 0.141 | HIGH |
| 62408 | -13.965 | 0.026 | 36.875 | 0.235 | 8.44 |
| 62409 | 17.980 | 0.034 | 3.978 | 0.025 | HIGH |
| 62410 | -61.840 | 0.117 | 50.156 | 0.320 | 2.95 |
| 62411 | -9.733 | 0.018 | 61.216 | 0.391 | 3.73 |
| 62412 | -23.989 | 0.045 | 35.363 | 0.226 | 7.39 |
| 62413 | -13.629 | 0.026 | 149.886 | 0.957 | 0.05 |
| 62414 | -1.270 | 0.002 | 43.985 | 0.281 | 8.03 |
| 62415 | 3.251 | 0.006 | 43.307 | 0.277 | 7.96 |
| 63301 | 45.710 | 0.086 | 5.083 | 0.032 | HIGH |
| 63302 | 29.307 | 0.055 | 12.883 | 0.082 | HIGH |
| 63303 | 25.712 | 0.049 | 17.606 | 0.112 | HIGH |
| 63304 | -17.562 | 0.033 | 7.425 | 0.047 | HIGH |
| 63305 | 20.239 | 0.038 | 7.365 | 0.047 | HIGH |
| 63306 | 7.833 | 0.015 | 17.704 | 0.113 | HIGH |
| 63307 | 96.790 | 0.183 | 4.378 | 0.028 | 4.42 |
| 63308 | 71.372 | 0.135 | 12.355 | 0.079 | 5.83 |
| 63313 | 9.737 | 0.018 | 10.906 | 0.070 | HIGH |
| 63314 | 15.280 | 0.029 | 8.629 | 0.055 | HIGH |
| 63319 | 63.127 | 0.119 | 9.460 | 0.060 | 6.91 |
| 63320 | 33.152 | 0.063 | 6.704 | 0.043 | HIGH |
| 63321 | -9.856 | 0.019 | 18.522 | 0.118 | HIGH |
| 63322 | -0.037 | 0.000 | 7.421 | 0.047 | HIGH |

251'S'9

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: RETROLAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63323 | 14.999 | 0.028 | 11.776 | 0.075 | HIGH |
| 63324 | 117.867 | 0.222 | 17.100 | 0.109 | 3.11 |
| 63327 | 153.065 | 0.289 | 17.459 | 0.111 | 2.22 |
| 63328 | 56.436 | 0.106 | 11.115 | 0.071 | 7.60 |
| 63329 | 45.244 | 0.085 | 7.181 | 0.046 | HIGH |
| 63330 | 3.100 | 0.006 | 9.682 | 0.062 | HIGH |
| 63331 | -20.264 | 0.038 | 19.307 | 0.123 | HIGH |
| 63332 | -21.395 | 0.040 | 8.003 | 0.051 | HIGH |
| 63333 | -8.887 | 0.017 | 14.328 | 0.091 | HIGH |
| 63334 | 19.641 | 0.037 | 42.172 | 0.269 | 6.26 |
| 63338 | 75.071 | 0.142 | 42.645 | 0.272 | 3.09 |
| 63339 | 39.772 | 0.075 | 13.860 | 0.089 | HIGH |
| 63340 | 16.855 | 0.032 | 6.198 | 0.040 | HIGH |
| 63341 | -2.668 | 0.005 | 13.761 | 0.088 | HIGH |
| 63342 | -27.602 | 0.052 | 13.701 | 0.087 | HIGH |
| 63343 | -34.597 | 0.065 | 11.820 | 0.075 | HIGH |
| 63344 | -38.762 | 0.073 | 18.056 | 0.115 | 9.42 |
| 63345 | -35.040 | 0.066 | 45.933 | 0.293 | 4.46 |
| 63350 | 18.794 | 0.035 | 45.534 | 0.291 | 5.64 |
| 63351 | 5.813 | 0.011 | 18.886 | 0.121 | HIGH |
| 63352 | -0.542 | 0.001 | 8.466 | 0.054 | HIGH |
| 63353 | -7.264 | 0.014 | 11.631 | 0.074 | HIGH |
| 63354 | -26.621 | 0.050 | 9.880 | 0.063 | HIGH |
| 63355 | -31.655 | 0.060 | 10.714 | 0.068 | HIGH |
| 63356 | -38.491 | 0.073 | 7.225 | 0.046 | HIGH |
| 63357 | -40.173 | 0.076 | 37.878 | 0.242 | 5.28 |
| 63363 | 1.495 | 0.003 | 39.634 | 0.253 | 9.74 |
| 63364 | -1.818 | 0.003 | 8.397 | 0.054 | HIGH |
| 63365 | -1.413 | 0.003 | 9.470 | 0.060 | HIGH |
| 63366 | -2.391 | 0.005 | 9.743 | 0.062 | HIGH |
| 63367 | -17.724 | 0.033 | 6.182 | 0.039 | HIGH |
| 63368 | -18.871 | 0.036 | 6.284 | 0.040 | HIGH |
| 63369 | -25.038 | 0.047 | 5.429 | 0.035 | HIGH |
| 63370 | -25.611 | 0.048 | 10.008 | 0.064 | HIGH |
| 63371 | -14.113 | 0.027 | 34.803 | 0.222 | 9.15 |
| 63376 | 15.203 | 0.029 | 38.874 | 0.248 | 7.62 |
| 63377 | 6.174 | 0.012 | 10.776 | 0.069 | HIGH |
| 63378 | 5.558 | 0.010 | 3.606 | 0.023 | HIGH |
| 63379 | 12.762 | 0.024 | 9.275 | 0.059 | HIGH |
| 63380 | 13.416 | 0.025 | 17.382 | 0.111 | HIGH |
| 63381 | 1.104 | 0.002 | 2.042 | 0.013 | HIGH |
| 63382 | -0.328 | 0.001 | 2.075 | 0.013 | HIGH |
| 63383 | -6.347 | 0.012 | 2.571 | 0.016 | HIGH |
| 63384 | -8.119 | 0.015 | 2.187 | 0.014 | HIGH |
| 63385 | 2.284 | 0.004 | 3.396 | 0.022 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: [illegible] LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63386 | 24.481 | 0.046 | 22.077 | 0.141 | HIGH |
| 63390 | 43.306 | 0.082 | 24.799 | 0.158 | 7.23 |
| 63391 | 19.404 | 0.037 | 3.624 | 0.023 | HIGH |
| 63392 | 13.771 | 0.026 | 1.559 | 0.010 | HIGH |
| 63393 | 20.404 | 0.038 | 1.880 | 0.012 | HIGH |
| 63394 | 45.501 | 0.086 | 20.250 | 0.129 | 7.79 |
| 63396 | -31.866 | 0.060 | 1.598 | 0.010 | HIGH |
| 63397 | -25.666 | 0.048 | 1.731 | 0.011 | HIGH |
| 63398 | -18.387 | 0.035 | 1.186 | 0.008 | HIGH |
| 63399 | -10.319 | 0.019 | 2.491 | 0.016 | HIGH |
| 63400 | -3.518 | 0.007 | 4.998 | 0.032 | HIGH |
| 63401 | -2.999 | 0.006 | 6.134 | 0.039 | HIGH |
| 63402 | -8.719 | 0.016 | 5.279 | 0.034 | HIGH |
| 63403 | -8.979 | 0.017 | 13.196 | 0.084 | HIGH |
| 63406 | -25.414 | 0.048 | 5.250 | 0.034 | HIGH |
| 63407 | -22.889 | 0.043 | 5.306 | 0.034 | HIGH |
| 63408 | -16.543 | 0.031 | 3.126 | 0.020 | HIGH |
| 63409 | -9.543 | 0.018 | 8.804 | 0.056 | HIGH |
| 63410 | -5.211 | 0.010 | 12.005 | 0.077 | HIGH |
| 63411 | -17.477 | 0.033 | 12.060 | 0.077 | HIGH |
| 63412 | -29.571 | 0.056 | 12.832 | 0.082 | HIGH |
| 63413 | 13.658 | 0.026 | 46.793 | 0.299 | 5.82 |
| 63415 | -21.553 | 0.041 | 10.377 | 0.066 | HIGH |
| 63416 | -22.966 | 0.043 | 10.124 | 0.065 | HIGH |
| 63417 | -22.182 | 0.042 | 10.992 | 0.070 | HIGH |
| 63418 | -20.304 | 0.038 | 14.518 | 0.093 | HIGH |
| 63419 | -23.817 | 0.045 | 15.602 | 0.100 | HIGH |
| 63420 | -66.122 | 0.125 | 20.910 | 0.134 | 5.48 |
| 63421 | -176.429 | 0.333 | 5.930 | 0.038 | 1.97 |
| 63424 | -17.179 | 0.032 | 17.547 | 0.112 | HIGH |
| 63425 | -28.925 | 0.055 | 13.009 | 0.083 | HIGH |
| 63426 | -40.143 | 0.076 | 22.098 | 0.141 | 8.24 |
| 63432 | -5.549 | 0.010 | 32.386 | 0.207 | HIGH |
| 63433 | -30.492 | 0.058 | 39.589 | 0.253 | 5.77 |
| 63440 | 38.110 | 0.072 | 62.292 | 0.398 | 2.69 |
| 63450 | 89.057 | 0.168 | 87.388 | 0.558 | 0.89 |
| 63455 | -82.641 | 0.156 | 51.156 | 0.327 | 2.37 |
| 63456 | 50.717 | 0.096 | 30.648 | 0.196 | 5.52 |
| 63457 | 8.311 | 0.016 | 51.434 | 0.328 | 5.32 |
| 63463 | -45.391 | 0.086 | 24.555 | 0.157 | 7.02 |
| 63464 | 5.219 | 0.010 | 20.772 | 0.133 | HIGH |
| 63465 | 13.438 | 0.025 | 21.843 | 0.139 | HIGH |
| 63467 | -45.556 | 0.086 | 35.861 | 0.229 | 5.18 |
| 63470 | -20.370 | 0.038 | 24.308 | 0.155 | HIGH |
| 63471 | -7.212 | 0.014 | 23.483 | 0.150 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: [illegible]J LAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63472 | 15.847 | 0.030 | 12.980 | 0.083 | HIGH |
| 63473 | 50.074 | 0.094 | 15.331 | 0.098 | 7.96 |
| 63474 | -38.194 | 0.072 | 28.926 | 0.185 | 7.06 |
| 63475 | -12.569 | 0.024 | 19.031 | 0.122 | HIGH |
| 63476 | -3.315 | 0.006 | 18.659 | 0.119 | HIGH |
| 63477 | 0.262 | 0.000 | 18.506 | 0.118 | HIGH |
| 63478 | 6.858 | 0.013 | 9.922 | 0.063 | HIGH |
| 63479 | 23.554 | 0.044 | 20.585 | 0.131 | HIGH |
| 63480 | -0.492 | 0.001 | 19.475 | 0.124 | HIGH |
| 63481 | 5.552 | 0.010 | 16.866 | 0.108 | HIGH |
| 63482 | 6.461 | 0.012 | 15.949 | 0.102 | HIGH |
| 63483 | 6.346 | 0.012 | 12.264 | 0.078 | HIGH |
| 63484 | 11.335 | 0.021 | 17.330 | 0.111 | HIGH |
| 63485 | 16.915 | 0.032 | 11.664 | 0.074 | HIGH |
| 63486 | 12.004 | 0.023 | 11.056 | 0.071 | HIGH |
| 63487 | 5.140 | 0.010 | 8.660 | 0.055 | HIGH |
| 63488 | 5.537 | 0.010 | 10.331 | 0.066 | HIGH |
| 63489 | 24.867 | 0.047 | 10.209 | 0.065 | HIGH |
| 63490 | 3.414 | 0.006 | 3.369 | 0.022 | HIGH |
| 63491 | 3.850 | 0.007 | 2.734 | 0.017 | HIGH |
| 63492 | 11.113 | 0.021 | 40.110 | 0.256 | 7.84 |
| 63499 | -60.690 | 0.115 | 18.011 | 0.115 | 6.29 |
| 63500 | -30.521 | 0.058 | 6.853 | 0.044 | HIGH |
| 63501 | -5.460 | 0.010 | 7.148 | 0.046 | HIGH |
| 63502 | 6.734 | 0.013 | 6.307 | 0.040 | HIGH |
| 63503 | 10.342 | 0.020 | 3.725 | 0.024 | HIGH |
| 63504 | 9.712 | 0.018 | 2.214 | 0.014 | HIGH |
| 63505 | 6.892 | 0.013 | 25.747 | 0.164 | HIGH |
| 63509 | -34.256 | 0.065 | 13.400 | 0.086 | HIGH |
| 63510 | -25.390 | 0.048 | 13.560 | 0.087 | HIGH |
| 63511 | -2.551 | 0.005 | 13.534 | 0.086 | HIGH |
| 63512 | 3.821 | 0.007 | 10.778 | 0.069 | HIGH |
| 63513 | 3.474 | 0.007 | 4.548 | 0.029 | HIGH |
| 63514 | -3.631 | 0.007 | 9.922 | 0.063 | HIGH |
| 63515 | -25.337 | 0.048 | 17.935 | 0.115 | HIGH |
| 63518 | -186.279 | 0.351 | 5.293 | 0.034 | 1.82 |
| 63519 | -77.672 | 0.147 | 21.726 | 0.139 | 4.62 |
| 63520 | -20.302 | 0.038 | 16.438 | 0.105 | HIGH |
| 63521 | -7.334 | 0.014 | 15.593 | 0.100 | HIGH |
| 63522 | -3.967 | 0.007 | 12.921 | 0.083 | HIGH |
| 63523 | -3.277 | 0.006 | 11.939 | 0.076 | HIGH |
| 63524 | -7.990 | 0.015 | 12.487 | 0.080 | HIGH |
| 63530 | -16.683 | 0.031 | 23.525 | 0.150 | HIGH |
| 63531 | -7.618 | 0.014 | 15.120 | 0.097 | HIGH |
| 63532 | -1.886 | 0.004 | 19.331 | 0.123 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: POLAR LANDING LOADS

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63539 | -13.202 | 0.025 | 43.359 | 0.277 | 6.66 |
| 63540 | 9.367 | 0.018 | 35.967 | 0.230 | 9.65 |
| 63550 | 66.430 | 0.125 | 65.487 | 0.418 | 1.92 |
| 63553 | 62.482 | 0.118 | 29.778 | 0.190 | 4.79 |
| 63554 | -66.143 | 0.125 | 49.096 | 0.314 | 2.90 |
| 63559 | 109.216 | 0.206 | 93.841 | 0.599 | 0.63 |
| 63561 | 21.038 | 0.040 | 21.885 | 0.140 | HIGH |
| 63562 | 9.198 | 0.017 | 19.380 | 0.124 | HIGH |
| 63563 | -28.788 | 0.054 | 22.999 | 0.147 | HIGH |
| 63568 | 13.497 | 0.025 | 18.599 | 0.119 | HIGH |
| 63569 | 6.862 | 0.013 | 15.148 | 0.097 | HIGH |
| 63570 | -5.484 | 0.010 | 23.019 | 0.147 | HIGH |
| 63571 | -9.097 | 0.017 | 24.075 | 0.154 | HIGH |
| 63574 | -36.046 | 0.068 | 34.522 | 0.220 | 6.20 |
| 63575 | 1.769 | 0.003 | 29.466 | 0.188 | HIGH |
| 63576 | 4.903 | 0.009 | 8.628 | 0.055 | HIGH |
| 63577 | 9.170 | 0.017 | 18.498 | 0.118 | HIGH |
| 63578 | 10.974 | 0.021 | 18.603 | 0.119 | HIGH |
| 63579 | -0.320 | 0.001 | 18.344 | 0.117 | HIGH |
| 63580 | -30.585 | 0.058 | 29.295 | 0.187 | 8.02 |
| 63581 | 4.912 | 0.009 | 27.469 | 0.175 | HIGH |
| 63582 | 15.027 | 0.028 | 11.653 | 0.074 | HIGH |
| 63583 | 21.972 | 0.041 | 15.888 | 0.101 | HIGH |
| 63584 | 22.696 | 0.043 | 16.461 | 0.105 | HIGH |
| 63585 | 10.572 | 0.020 | 17.503 | 0.112 | HIGH |
| 63586 | 14.356 | 0.027 | 18.318 | 0.117 | HIGH |
| 63587 | 23.634 | 0.045 | 10.670 | 0.068 | HIGH |
| 63588 | 29.936 | 0.056 | 10.709 | 0.068 | HIGH |
| 63589 | 28.816 | 0.054 | 9.375 | 0.060 | HIGH |
| 63590 | 21.946 | 0.041 | 8.352 | 0.053 | HIGH |
| 63591 | 27.555 | 0.052 | 6.731 | 0.043 | HIGH |
| 63592 | 30.276 | 0.057 | 6.735 | 0.043 | HIGH |
| 63593 | 23.773 | 0.045 | 2.453 | 0.016 | HIGH |
| 63594 | 24.414 | 0.046 | 3.793 | 0.024 | HIGH |
| 63595 | 21.617 | 0.041 | 1.598 | 0.010 | HIGH |

S.S.160

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. SIRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12201 | -0.748 | 0.001 | 0.055 | 0.000 | HIGH |
| 12202 | 3.594 | 0.007 | 0.064 | 0.000 | HIGH |
| 12204 | -2.391 | 0.005 | 0.055 | 0.000 | HIGH |
| 12205 | 0.598 | 0.001 | 0.021 | 0.000 | HIGH |
| 12206 | -1.980 | 0.004 | 0.062 | 0.000 | HIGH |
| 12207 | -2.542 | 0.005 | 0.212 | 0.001 | HIGH |
| 12208 | -1.443 | 0.003 | 0.168 | 0.001 | HIGH |
| 12215 | -0.780 | 0.001 | 0.116 | 0.001 | HIGH |
| 12216 | -0.135 | 0.000 | 0.108 | 0.001 | HIGH |
| 12222 | -2.105 | 0.004 | 0.175 | 0.001 | HIGH |
| 12223 | -2.731 | 0.005 | 0.208 | 0.001 | HIGH |
| 12224 | 0.346 | 0.001 | 0.184 | 0.001 | HIGH |
| 12225 | 0.299 | 0.001 | 0.140 | 0.001 | HIGH |
| 12226 | 0.589 | 0.001 | 0.037 | 0.000 | HIGH |
| 12227 | 2.395 | 0.005 | 1.262 | 0.008 | HIGH |
| 12228 | 4.807 | 0.009 | 1.612 | 0.010 | HIGH |
| 12229 | -5.572 | 0.011 | 2.508 | 0.016 | HIGH |
| 12230 | -3.139 | 0.006 | 0.426 | 0.003 | HIGH |
| 12231 | -3.054 | 0.006 | 0.278 | 0.002 | HIGH |
| 12232 | -3.494 | 0.007 | 0.116 | 0.001 | HIGH |
| 12233 | -3.671 | 0.007 | 0.987 | 0.006 | HIGH |
| 12234 | 0.694 | 0.001 | 0.092 | 0.001 | HIGH |
| 12235 | 0.725 | 0.001 | 0.163 | 0.001 | HIGH |
| 12236 | 2.168 | 0.004 | 0.009 | 0.000 | HIGH |
| 12237 | 2.953 | 0.006 | 0.040 | 0.000 | HIGH |
| 12238 | 6.882 | 0.013 | 0.878 | 0.006 | HIGH |
| 12239 | 20.172 | 0.038 | 0.996 | 0.006 | HIGH |
| 12240 | -5.171 | 0.010 | 9.183 | 0.059 | HIGH |
| 12241 | -5.338 | 0.010 | 10.258 | 0.066 | HIGH |
| 12242 | -4.704 | 0.009 | 5.715 | 0.036 | HIGH |
| 12243 | -4.730 | 0.009 | 1.207 | 0.008 | HIGH |
| 12244 | -4.327 | 0.008 | 0.969 | 0.006 | HIGH |
| 12245 | 0.543 | 0.001 | 0.045 | 0.000 | HIGH |
| 12246 | 0.654 | 0.001 | 0.122 | 0.001 | HIGH |
| 12247 | 2.107 | 0.004 | 0.038 | 0.000 | HIGH |
| 12248 | 3.166 | 0.006 | 0.013 | 0.000 | HIGH |
| 12249 | 8.185 | 0.015 | 0.774 | 0.005 | HIGH |
| 12250 | 13.396 | 0.025 | 4.553 | 0.029 | HIGH |
| 12251 | -7.530 | 0.014 | 44.326 | 0.283 | 7.06 |
| 12252 | -1.350 | 0.003 | 0.112 | 0.001 | HIGH |
| 12253 | -10.490 | 0.020 | 37.600 | 0.240 | 8.79 |
| 12254 | -6.356 | 0.012 | 3.511 | 0.022 | HIGH |
| 12255 | -4.703 | 0.009 | 2.618 | 0.017 | HIGH |
| 12256 | -3.778 | 0.007 | 1.413 | 0.009 | HIGH |
| 12257 | 0.367 | 0.001 | 0.056 | 0.000 | HIGH |

S.S.161

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12258 | 0.367 | 0.001 | 0.062 | 0.000 | HIGH |
| 12259 | 0.618 | 0.001 | 0.139 | 0.001 | HIGH |
| 12260 | 1.638 | 0.003 | 0.042 | 0.000 | HIGH |
| 12261 | 4.595 | 0.009 | 0.365 | 0.002 | HIGH |
| 12262 | 6.753 | 0.013 | 1.386 | 0.009 | HIGH |
| 12263 | 15.879 | 0.030 | 3.045 | 0.019 | HIGH |
| 12264 | -3.473 | 0.007 | 20.235 | 0.129 | HIGH |
| 12265 | -4.469 | 0.008 | 16.654 | 0.106 | HIGH |
| 12266 | -4.406 | 0.008 | 5.698 | 0.036 | HIGH |
| 12267 | -3.573 | 0.007 | 1.487 | 0.009 | HIGH |
| 12268 | -2.836 | 0.005 | 1.368 | 0.009 | HIGH |
| 12269 | -2.391 | 0.005 | 0.577 | 0.004 | HIGH |
| 12270 | -0.387 | 0.001 | 0.063 | 0.000 | HIGH |
| 12271 | -0.438 | 0.001 | 0.025 | 0.000 | HIGH |
| 12272 | -0.641 | 0.001 | 0.015 | 0.000 | HIGH |
| 12273 | -0.922 | 0.002 | 0.006 | 0.000 | HIGH |
| 12274 | -0.872 | 0.002 | 0.014 | 0.000 | HIGH |
| 12275 | 3.217 | 0.006 | 0.020 | 0.000 | HIGH |
| 12278 | -0.546 | 0.001 | 0.229 | 0.001 | HIGH |
| 12279 | -0.830 | 0.002 | 0.038 | 0.000 | HIGH |
| 12280 | -0.086 | 0.000 | 0.020 | 0.000 | HIGH |
| 12281 | -2.308 | 0.004 | 0.017 | 0.000 | HIGH |
| 12282 | -2.071 | 0.004 | 0.032 | 0.000 | HIGH |
| 12283 | 0.352 | 0.001 | 0.198 | 0.001 | HIGH |
| 12286 | -0.733 | 0.001 | 0.217 | 0.001 | HIGH |
| 12287 | -1.198 | 0.002 | 0.025 | 0.000 | HIGH |
| 12288 | -1.988 | 0.004 | 0.010 | 0.000 | HIGH |
| 12289 | -3.120 | 0.006 | 0.010 | 0.000 | HIGH |
| 12290 | -4.676 | 0.009 | 0.045 | 0.000 | HIGH |
| 12293 | -0.643 | 0.001 | 0.211 | 0.001 | HIGH |
| 12294 | -1.096 | 0.002 | 0.043 | 0.000 | HIGH |
| 12295 | -0.453 | 0.001 | 0.011 | 0.000 | HIGH |
| 12296 | -5.864 | 0.011 | 0.230 | 0.001 | HIGH |
| 12297 | -10.444 | 0.020 | 0.448 | 0.003 | HIGH |
| 12300 | 1.979 | 0.004 | 0.267 | 0.002 | HIGH |
| 12301 | -0.758 | 0.001 | 0.561 | 0.004 | HIGH |
| 12302 | -5.467 | 0.010 | 1.032 | 0.007 | HIGH |
| 12303 | -6.980 | 0.013 | 1.490 | 0.010 | HIGH |
| 12304 | -8.933 | 0.017 | 2.028 | 0.013 | HIGH |
| 12308 | 0.269 | 0.001 | 1.130 | 0.007 | HIGH |
| 12309 | -0.095 | 0.000 | 1.406 | 0.009 | HIGH |
| 12310 | -7.866 | 0.015 | 4.835 | 0.031 | HIGH |
| 12311 | -8.604 | 0.016 | 3.476 | 0.022 | HIGH |
| 12312 | -7.925 | 0.015 | 0.258 | 0.002 | HIGH |
| 12316 | 2.672 | 0.005 | 1.925 | 0.012 | HIGH |

S.S.162

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12317 | 1.257 | 0.002 | 27.373 | 0.175 | HIGH |
| 12318 | -7.031 | 0.013 | 12.661 | 0.081 | HIGH |
| 12319 | -6.854 | 0.013 | 12.040 | 0.077 | HIGH |
| 12320 | -4.997 | 0.009 | 0.248 | 0.002 | HIGH |
| 12323 | 6.315 | 0.012 | 19.768 | 0.126 | HIGH |
| 12324 | 0.552 | 0.001 | 0.157 | 0.001 | HIGH |
| 12325 | -5.745 | 0.011 | 36.440 | 0.233 | HIGH |
| 12326 | -6.335 | 0.012 | 14.355 | 0.092 | HIGH |
| 12327 | -1.208 | 0.002 | 0.055 | 0.000 | HIGH |
| 12329 | 1.257 | 0.002 | 15.329 | 0.098 | HIGH |
| 12330 | 1.128 | 0.002 | 13.570 | 0.087 | HIGH |
| 12331 | -2.952 | 0.006 | 8.733 | 0.056 | HIGH |
| 12332 | -2.891 | 0.005 | 5.366 | 0.034 | HIGH |
| 12333 | -1.264 | 0.002 | 0.574 | 0.004 | HIGH |
| 12334 | 1.526 | 0.003 | 9.995 | 0.064 | HIGH |
| 12335 | 0.629 | 0.001 | 5.228 | 0.033 | HIGH |
| 12336 | -0.996 | 0.002 | 2.264 | 0.014 | HIGH |
| 12337 | -1.373 | 0.003 | 2.243 | 0.014 | HIGH |
| 12338 | 1.631 | 0.003 | 3.146 | 0.020 | HIGH |
| 12339 | 0.827 | 0.002 | 1.963 | 0.013 | HIGH |
| 12340 | -0.056 | 0.000 | 0.968 | 0.006 | HIGH |
| 12341 | 1.396 | 0.003 | 0.520 | 0.003 | HIGH |
| 12342 | 0.960 | 0.002 | 0.532 | 0.003 | HIGH |
| 12343 | 0.891 | 0.002 | 0.076 | 0.000 | HIGH |
| 12346 | 1.004 | 0.002 | 0.122 | 0.001 | HIGH |
| 12347 | 1.446 | 0.003 | 0.142 | 0.001 | HIGH |
| 12348 | 1.446 | 0.003 | 2.614 | 0.017 | HIGH |
| 12349 | 0.974 | 0.002 | 1.844 | 0.012 | HIGH |
| 12350 | 0.052 | 0.000 | 0.729 | 0.005 | HIGH |
| 12351 | -0.339 | 0.001 | 0.770 | 0.005 | HIGH |
| 12353 | 0.236 | 0.000 | 0.117 | 0.001 | HIGH |
| 12354 | 3.240 | 0.006 | 0.109 | 0.001 | HIGH |
| 12355 | 1.437 | 0.003 | 10.767 | 0.069 | HIGH |
| 12356 | 1.458 | 0.003 | 5.470 | 0.035 | HIGH |
| 12357 | -0.168 | 0.000 | 2.327 | 0.015 | HIGH |
| 12358 | -0.846 | 0.002 | 2.266 | 0.014 | HIGH |
| 12361 | 5.152 | 0.010 | 0.122 | 0.001 | HIGH |
| 12362 | 4.027 | 0.008 | 16.096 | 0.103 | HIGH |
| 12363 | 3.359 | 0.006 | 12.985 | 0.083 | HIGH |
| 12364 | -0.726 | 0.001 | 8.102 | 0.052 | HIGH |
| 12365 | -1.501 | 0.003 | 5.572 | 0.036 | HIGH |
| 12368 | 10.393 | 0.020 | 0.368 | 0.002 | HIGH |
| 12369 | 7.051 | 0.013 | 8.859 | 0.057 | HIGH |
| 12370 | 7.230 | 0.014 | 15.075 | 0.096 | HIGH |
| 12371 | -3.388 | 0.006 | 19.942 | 0.127 | HIGH |

S.S. 163

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12372 | -3.323 | 0.006 | 13.841 | 0.088 | HIGH |
| 12375 | 13.770 | 0.026 | 1.142 | 0.007 | HIGH |
| 12376 | 5.360 | 0.010 | 2.083 | 0.013 | HIGH |
| 12377 | 4.606 | 0.009 | 15.690 | 0.100 | HIGH |
| 12378 | -0.872 | 0.002 | 0.106 | 0.001 | HIGH |
| 12379 | -3.154 | 0.006 | 16.600 | 0.106 | HIGH |
| 12383 | 14.448 | 0.027 | 0.485 | 0.003 | HIGH |
| 12384 | 11.061 | 0.021 | 0.140 | 0.001 | HIGH |
| 12385 | 9.760 | 0.018 | 1.695 | 0.011 | HIGH |
| 12386 | -2.196 | 0.004 | 2.109 | 0.013 | HIGH |
| 12387 | -1.966 | 0.004 | 7.748 | 0.049 | HIGH |
| 12390 | 7.465 | 0.014 | 0.041 | 0.000 | HIGH |
| 12391 | 5.946 | 0.011 | 0.043 | 0.000 | HIGH |
| 12392 | 7.479 | 0.014 | 0.213 | 0.001 | HIGH |
| 12393 | 1.535 | 0.003 | 0.429 | 0.003 | HIGH |
| 12394 | 0.905 | 0.002 | 0.670 | 0.004 | HIGH |
| 12396 | 5.049 | 0.010 | 0.059 | 0.000 | HIGH |
| 12397 | 5.985 | 0.011 | 0.030 | 0.000 | HIGH |
| 12398 | 5.476 | 0.010 | 0.028 | 0.000 | HIGH |
| 12399 | -0.239 | 0.000 | 0.341 | 0.002 | HIGH |
| 12400 | -2.494 | 0.005 | 0.623 | 0.004 | HIGH |
| 12401 | 3.881 | 0.007 | 0.101 | 0.001 | HIGH |
| 12402 | 3.448 | 0.007 | 0.099 | 0.001 | HIGH |
| 12403 | 4.276 | 0.008 | 0.019 | 0.000 | HIGH |
| 12404 | 3.102 | 0.006 | 0.045 | 0.000 | HIGH |
| 12405 | -1.241 | 0.002 | 0.612 | 0.004 | HIGH |
| 12406 | 2.871 | 0.005 | 0.176 | 0.001 | HIGH |
| 12407 | 2.731 | 0.005 | 0.096 | 0.001 | HIGH |
| 12408 | 2.101 | 0.004 | 0.036 | 0.000 | HIGH |
| 12409 | 1.838 | 0.003 | 0.220 | 0.001 | HIGH |
| 12410 | 1.898 | 0.004 | 0.106 | 0.001 | HIGH |
| 12411 | 1.751 | 0.003 | 0.028 | 0.000 | HIGH |
| 12412 | 1.536 | 0.003 | 0.087 | 0.001 | HIGH |
| 12413 | 1.044 | 0.002 | 0.022 | 0.000 | HIGH |
| 12414 | 0.983 | 0.002 | 0.165 | 0.001 | HIGH |
| 12415 | 0.339 | 0.001 | 0.110 | 0.001 | HIGH |
| 12425 | -1.605 | 0.003 | 0.120 | 0.001 | HIGH |
| 12426 | 6.527 | 0.012 | 0.031 | 0.000 | HIGH |
| 12427 | 0.858 | 0.002 | 0.027 | 0.000 | HIGH |
| 12443 | 1.671 | 0.003 | 0.080 | 0.001 | HIGH |
| 12444 | 2.287 | 0.004 | 0.075 | 0.000 | HIGH |
| 12445 | 2.600 | 0.005 | 0.078 | 0.000 | HIGH |
| 12446 | 1.420 | 0.003 | 0.160 | 0.001 | HIGH |
| 12447 | 0.412 | 0.001 | 0.728 | 0.005 | HIGH |
| 12455 | -11.195 | 0.021 | 3.258 | 0.021 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12456 | -17.707 | 0.033 | 4.864 | 0.031 | HIGH |
| 12463 | 4.845 | 0.009 | 0.200 | 0.001 | HIGH |
| 12464 | -3.344 | 0.006 | 0.028 | 0.000 | HIGH |
| 12465 | 4.640 | 0.009 | 0.097 | 0.001 | HIGH |
| 13301 | -1.165 | 0.002 | 0.026 | 0.000 | HIGH |
| 13302 | 2.083 | 0.004 | 0.012 | 0.000 | HIGH |
| 13303 | 2.191 | 0.004 | 0.027 | 0.000 | HIGH |
| 13304 | -2.876 | 0.005 | 0.019 | 0.000 | HIGH |
| 13305 | 0.339 | 0.001 | 0.018 | 0.000 | HIGH |
| 13306 | -1.130 | 0.002 | 0.014 | 0.000 | HIGH |
| 13307 | -0.764 | 0.001 | 0.096 | 0.001 | HIGH |
| 13308 | -0.525 | 0.001 | 0.046 | 0.000 | HIGH |
| 13313 | -1.564 | 0.003 | 0.028 | 0.000 | HIGH |
| 13314 | -2.024 | 0.004 | 0.016 | 0.000 | HIGH |
| 13319 | -0.225 | 0.000 | 0.017 | 0.000 | HIGH |
| 13320 | -0.436 | 0.001 | 0.065 | 0.000 | HIGH |
| 13321 | -2.363 | 0.004 | 0.022 | 0.000 | HIGH |
| 13322 | -2.319 | 0.004 | 0.014 | 0.000 | HIGH |
| 13323 | -1.828 | 0.003 | 0.012 | 0.000 | HIGH |
| 13324 | -1.339 | 0.003 | 0.010 | 0.000 | HIGH |
| 13325 | -0.714 | 0.001 | 0.045 | 0.000 | HIGH |
| 13326 | -0.055 | 0.000 | 0.040 | 0.000 | HIGH |
| 13327 | 0.049 | 0.000 | 0.006 | 0.000 | HIGH |
| 13328 | 0.064 | 0.000 | 0.008 | 0.000 | HIGH |
| 13329 | -0.183 | 0.000 | 0.028 | 0.000 | HIGH |
| 13330 | -0.255 | 0.000 | 0.040 | 0.000 | HIGH |
| 13331 | -2.356 | 0.004 | 0.018 | 0.000 | HIGH |
| 13332 | -1.929 | 0.004 | 0.018 | 0.000 | HIGH |
| 13333 | -1.741 | 0.003 | 0.006 | 0.000 | HIGH |
| 13334 | -1.155 | 0.002 | 0.007 | 0.000 | HIGH |
| 13335 | -0.677 | 0.001 | 0.021 | 0.000 | HIGH |
| 13336 | -0.255 | 0.000 | 0.034 | 0.000 | HIGH |
| 13337 | -0.091 | 0.000 | 0.020 | 0.000 | HIGH |
| 13338 | -0.060 | 0.000 | 0.011 | 0.000 | HIGH |
| 13339 | -0.106 | 0.000 | 0.021 | 0.000 | HIGH |
| 13340 | -0.272 | 0.001 | 0.036 | 0.000 | HIGH |
| 13341 | 0.071 | 0.000 | 0.033 | 0.000 | HIGH |
| 13342 | -2.520 | 0.005 | 0.018 | 0.000 | HIGH |
| 13343 | -1.844 | 0.003 | 0.020 | 0.000 | HIGH |
| 13344 | -1.628 | 0.003 | 0.010 | 0.000 | HIGH |
| 13345 | -1.180 | 0.002 | 0.003 | 0.000 | HIGH |
| 13346 | -0.664 | 0.001 | 0.014 | 0.000 | HIGH |
| 13347 | -0.296 | 0.001 | 0.026 | 0.000 | HIGH |
| 13348 | -0.145 | 0.000 | 0.026 | 0.000 | HIGH |
| 13349 | -0.080 | 0.000 | 0.009 | 0.000 | HIGH |

591.5.5

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13350 | -0.137 | 0.000 | 0.021 | 0.000 | HIGH |
| 13351 | -0.103 | 0.000 | 0.028 | 0.000 | HIGH |
| 13352 | -0.008 | 0.000 | 0.031 | 0.000 | HIGH |
| 13353 | 0.502 | 0.001 | 0.028 | 0.000 | HIGH |
| 13354 | -3.387 | 0.006 | 0.027 | 0.000 | HIGH |
| 13355 | -2.174 | 0.004 | 0.027 | 0.000 | HIGH |
| 13356 | -1.688 | 0.003 | 0.011 | 0.000 | HIGH |
| 13357 | -1.197 | 0.002 | 0.005 | 0.000 | HIGH |
| 13358 | -0.697 | 0.001 | 0.012 | 0.000 | HIGH |
| 13359 | -0.275 | 0.001 | 0.020 | 0.000 | HIGH |
| 13360 | -0.077 | 0.000 | 0.0[illegible]0 | 0.000 | HIGH |
| 13361 | -0.102 | 0.000 | 0.01[illegible] | 0.000 | HIGH |
| 13362 | -0.162 | 0.000 | 0.020 | 0.000 | HIGH |
| 13363 | -0.095 | 0.000 | 0.024 | 0.000 | HIGH |
| 13364 | 0.183 | 0.000 | 0.024 | 0.000 | HIGH |
| 13365 | 0.584 | 0.001 | 0.025 | 0.000 | HIGH |
| 13366 | 1.455 | 0.003 | 0.023 | 0.000 | HIGH |
| 13367 | -4.136 | 0.008 | 0.158 | 0.001 | HIGH |
| 13368 | -2.678 | 0.005 | 0.034 | 0.000 | HIGH |
| 13369 | -1.793 | 0.003 | 0.005 | 0.000 | HIGH |
| 13370 | -1.168 | 0.002 | 0.003 | 0.000 | HIGH |
| 13371 | -0.693 | 0.001 | 0.008 | 0.000 | HIGH |
| 13372 | -0.263 | 0.000 | 0.017 | 0.000 | HIGH |
| 13373 | 0.041 | 0.000 | 0.018 | 0.000 | HIGH |
| 13374 | 0.058 | 0.000 | 0.017 | 0.000 | HIGH |
| 13375 | -0.196 | 0.000 | 0.019 | 0.000 | HIGH |
| 13376 | -0.207 | 0.000 | 0.025 | 0.000 | HIGH |
| 13377 | 0.097 | 0.000 | 0.024 | 0.000 | HIGH |
| 13378 | 0.677 | 0.001 | 0.015 | 0.000 | HIGH |
| 13379 | 1.343 | 0.003 | 0.023 | 0.000 | HIGH |
| 13380 | 2.320 | 0.004 | 0.044 | 0.000 | HIGH |
| 13382 | -2.531 | 0.005 | 0.093 | 0.001 | HIGH |
| 13383 | -1.469 | 0.003 | 0.004 | 0.000 | HIGH |
| 13384 | -0.814 | 0.002 | 0.001 | 0.000 | HIGH |
| 13385 | -0.497 | 0.001 | 0.002 | 0.000 | HIGH |
| 13386 | -0.240 | 0.000 | 0.008 | 0.000 | HIGH |
| 13387 | 0.064 | 0.000 | 0.015 | 0.000 | HIGH |
| 13388 | 0.226 | 0.000 | 0.019 | 0.000 | HIGH |
| 13389 | 0.016 | 0.000 | 0.011 | 0.000 | HIGH |
| 13390 | -0.267 | 0.001 | 0.026 | 0.000 | HIGH |
| 13391 | -0.126 | 0.000 | 0.022 | 0.000 | HIGH |
| 13392 | 0.387 | 0.001 | 0.014 | 0.000 | HIGH |
| 13393 | 1.106 | 0.002 | 0.007 | 0.000 | HIGH |
| 13394 | 1.886 | 0.004 | 0.041 | 0.000 | HIGH |
| 13397 | 1.066 | 0.002 | 0.109 | 0.001 | HIGH |

291.5.5

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13398 | -0.203 | 0.000 | 0.022 | 0.000 | HIGH |
| 13399 | -0.803 | 0.002 | 0.002 | 0.000 | HIGH |
| 13400 | -0.812 | 0.002 | 0.004 | 0.000 | HIGH |
| 13401 | -0.559 | 0.001 | 0.005 | 0.000 | HIGH |
| 13402 | 0.071 | 0.000 | 0.006 | 0.000 | HIGH |
| 13403 | 1.637 | 0.003 | 0.039 | 0.000 | HIGH |
| 13406 | 1.164 | 0.002 | 0.060 | 0.000 | HIGH |
| 13407 | 0.198 | 0.000 | 0.043 | 0.000 | HIGH |
| 13408 | -0.671 | 0.001 | 0.017 | 0.000 | HIGH |
| 13409 | -1.143 | 0.002 | 0.008 | 0.000 | HIGH |
| 13410 | -1.347 | 0.003 | 0.008 | 0.000 | HIGH |
| 13411 | -1.524 | 0.003 | 0.009 | 0.000 | HIGH |
| 13412 | -1.665 | 0.003 | 0.036 | 0.000 | HIGH |
| 13413 | 0.056 | 0.000 | 0.112 | 0.001 | HIGH |
| 13415 | 0.059 | 0.000 | 0.034 | 0.000 | HIGH |
| 13416 | -0.617 | 0.001 | 0.030 | 0.000 | HIGH |
| 13417 | -1.227 | 0.002 | 0.020 | 0.000 | HIGH |
| 13418 | -1.704 | 0.003 | 0.013 | 0.000 | HIGH |
| 13419 | -2.140 | 0.004 | 0.010 | 0.000 | HIGH |
| 13420 | -2.713 | 0.005 | 0.008 | 0.000 | HIGH |
| 13421 | -2.858 | 0.005 | 0.006 | 0.000 | HIGH |
| 13424 | -0.936 | 0.002 | 0.028 | 0.000 | HIGH |
| 13425 | -1.362 | 0.003 | 0.027 | 0.000 | HIGH |
| 13426 | -1.823 | 0.003 | 0.021 | 0.000 | HIGH |
| 13427 | -2.307 | 0.004 | 0.012 | 0.000 | HIGH |
| 13428 | -2.809 | 0.005 | 0.006 | 0.000 | HIGH |
| 13429 | -3.274 | 0.006 | 0.021 | 0.000 | HIGH |
| 13430 | -3.680 | 0.007 | 0.029 | 0.000 | HIGH |
| 13432 | -1.511 | 0.003 | 0.031 | 0.000 | HIGH |
| 13433 | -1.916 | 0.004 | 0.029 | 0.000 | HIGH |
| 13434 | -2.329 | 0.004 | 0.019 | 0.000 | HIGH |
| 13435 | -2.736 | 0.005 | 0.006 | 0.000 | HIGH |
| 13436 | -3.090 | 0.006 | 0.008 | 0.000 | HIGH |
| 13437 | -3.499 | 0.007 | 0.101 | 0.001 | HIGH |
| 13438 | -3.366 | 0.006 | 0.016 | 0.000 | HIGH |
| 13440 | -1.893 | 0.004 | 0.039 | 0.000 | HIGH |
| 13441 | -2.353 | 0.004 | 0.035 | 0.000 | HIGH |
| 13442 | -2.642 | 0.005 | 0.013 | 0.000 | HIGH |
| 13443 | -2.825 | 0.005 | 0.002 | 0.000 | HIGH |
| 13444 | -2.963 | 0.006 | 0.024 | 0.000 | HIGH |
| 13445 | -3.113 | 0.006 | 0.036 | 0.000 | HIGH |
| 13446 | -3.064 | 0.006 | 0.003 | 0.000 | HIGH |
| 13450 | -2.271 | 0.004 | 0.071 | 0.000 | HIGH |
| 13451 | -2.617 | 0.005 | 0.033 | 0.000 | HIGH |
| 13452 | -2.619 | 0.005 | 0.006 | 0.000 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13453 | -2.579 | 0.005 | 0.005 | 0.000 | HIGH |
| 13454 | -2.583 | 0.005 | 0.011 | 0.000 | HIGH |
| 13455 | -2.601 | 0.005 | 0.009 | 0.000 | HIGH |
| 13456 | -2.490 | 0.005 | 0.011 | 0.000 | HIGH |
| 13457 | -1.789 | 0.003 | 0.026 | 0.000 | HIGH |
| 13459 | -2.339 | 0.004 | 0.096 | 0.001 | HIGH |
| 13460 | -2.371 | 0.004 | 0.014 | 0.000 | HIGH |
| 13461 | -2.136 | 0.004 | 0.012 | 0.000 | HIGH |
| 13462 | -2.096 | 0.004 | 0.007 | 0.000 | HIGH |
| 13463 | -2.054 | 0.004 | 0.001 | 0.000 | HIGH |
| 13464 | -1.994 | 0.004 | 0.003 | 0.000 | HIGH |
| 13465 | -1.705 | 0.003 | 0.008 | 0.000 | HIGH |
| 13467 | -1.553 | 0.003 | 0.032 | 0.000 | HIGH |
| 13468 | -1.509 | 0.003 | 0.025 | 0.000 | HIGH |
| 13469 | -1.431 | 0.003 | 0.020 | 0.000 | HIGH |
| 13470 | -1.481 | 0.003 | 0.009 | 0.000 | HIGH |
| 13471 | -1.499 | 0.003 | 0.003 | 0.000 | HIGH |
| 13472 | -1.320 | 0.002 | 0.001 | 0.000 | HIGH |
| 13473 | -1.170 | 0.002 | 0.038 | 0.000 | HIGH |
| 13474 | -0.256 | 0.000 | 0.076 | 0.000 | HIGH |
| 13475 | -0.524 | 0.001 | 0.046 | 0.000 | HIGH |
| 13476 | -0.809 | 0.002 | 0.023 | 0.000 | HIGH |
| 13477 | -1.070 | 0.002 | 0.013 | 0.000 | HIGH |
| 13478 | -1.149 | 0.002 | 0.006 | 0.000 | HIGH |
| 13479 | -1.314 | 0.002 | 0.028 | 0.000 | HIGH |
| 13480 | 0.499 | 0.001 | 0.118 | 0.001 | HIGH |
| 13481 | 0.000 | 0.000 | 0.048 | 0.000 | HIGH |
| 13482 | -0.559 | 0.001 | 0.029 | 0.000 | HIGH |
| 13483 | -0.941 | 0.002 | 0.021 | 0.000 | HIGH |
| 13484 | -1.239 | 0.002 | 0.019 | 0.000 | HIGH |
| 13485 | 0.640 | 0.001 | 0.090 | 0.001 | HIGH |
| 13486 | 0.045 | 0.000 | 0.044 | 0.000 | HIGH |
| 13487 | -0.599 | 0.001 | 0.047 | 0.000 | HIGH |
| 13488 | -1.175 | 0.002 | 0.027 | 0.000 | HIGH |
| 13489 | 0.755 | 0.001 | 0.042 | 0.000 | HIGH |
| 13490 | 0.170 | 0.000 | 0.080 | 0.001 | HIGH |
| 13491 | -0.506 | 0.001 | 0.074 | 0.000 | HIGH |
| 13492 | 2.607 | 0.005 | 0.076 | 0.000 | HIGH |
| 13499 | -1.633 | 0.003 | 0.114 | 0.001 | HIGH |
| 13500 | -0.679 | 0.001 | 0.009 | 0.000 | HIGH |
| 13501 | -0.242 | 0.000 | 0.007 | 0.000 | HIGH |
| 13502 | -0.164 | 0.000 | 0.009 | 0.000 | HIGH |
| 13503 | -0.300 | 0.001 | 0.009 | 0.000 | HIGH |
| 13504 | -0.871 | 0.002 | 0.013 | 0.000 | HIGH |
| 13505 | -1.834 | 0.003 | 0.111 | 0.001 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13509 | -0.402 | 0.001 | 0.032 | 0.000 | HIGH |
| 13510 | -0.029 | 0.000 | 0.013 | 0.000 | HIGH |
| 13511 | 0.145 | 0.000 | 0.012 | 0.000 | HIGH |
| 13512 | 0.061 | 0.000 | 0.020 | 0.000 | HIGH |
| 13513 | -0.327 | 0.001 | 0.029 | 0.000 | HIGH |
| 13514 | -0.977 | 0.002 | 0.038 | 0.000 | HIGH |
| 13515 | -1.610 | 0.003 | 0.052 | 0.000 | HIGH |
| 13518 | 0.335 | 0.001 | 0.055 | 0.000 | HIGH |
| 13519 | 0.533 | 0.001 | 0.033 | 0.000 | HIGH |
| 13520 | 0.590 | 0.001 | 0.011 | 0.000 | HIGH |
| 13521 | 0.567 | 0.001 | 0.024 | 0.000 | HIGH |
| 13522 | 0.302 | 0.001 | 0.042 | 0.000 | HIGH |
| 13523 | -0.264 | 0.000 | 0.049 | 0.000 | HIGH |
| 13524 | -0.875 | 0.002 | 0.053 | 0.000 | HIGH |
| 13526 | 1.153 | 0.002 | 0.060 | 0.000 | HIGH |
| 13527 | 1.131 | 0.002 | 0.053 | 0.000 | HIGH |
| 13528 | 1.111 | 0.002 | 0.025 | 0.000 | HIGH |
| 13529 | 1.118 | 0.002 | 0.017 | 0.000 | HIGH |
| 13530 | 1.064 | 0.002 | 0.044 | 0.000 | HIGH |
| 13531 | 0.775 | 0.001 | 0.070 | 0.000 | HIGH |
| 13532 | 0.308 | 0.001 | 0.076 | 0.000 | HIGH |
| 13534 | 1.822 | 0.003 | 0.014 | 0.000 | HIGH |
| 13535 | 1.723 | 0.003 | 0.116 | 0.001 | HIGH |
| 13536 | 1.572 | 0.003 | 0.033 | 0.000 | HIGH |
| 13537 | 1.544 | 0.003 | 0.013 | 0.000 | HIGH |
| 13538 | 1.696 | 0.003 | 0.032 | 0.000 | HIGH |
| 13539 | 1.746 | 0.003 | 0.079 | 0.001 | HIGH |
| 13540 | 1.534 | 0.003 | 0.131 | 0.001 | HIGH |
| 13544 | 2.600 | 0.005 | 0.060 | 0.000 | HIGH |
| 13545 | 2.431 | 0.005 | 0.059 | 0.000 | HIGH |
| 13546 | 2.022 | 0.004 | 0.046 | 0.000 | HIGH |
| 13547 | 1.884 | 0.004 | 0.023 | 0.000 | HIGH |
| 13548 | 1.324 | 0.004 | 0.015 | 0.000 | HIGH |
| 13549 | 2.125 | 0.004 | 0.058 | 0.000 | HIGH |
| 13550 | 2.197 | 0.004 | 0.169 | 0.001 | HIGH |
| 13553 | 3.077 | 0.006 | 0.051 | 0.000 | HIGH |
| 13554 | 2.919 | 0.006 | 0.027 | 0.000 | HIGH |
| 13555 | 2.456 | 0.005 | 0.031 | 0.000 | HIGH |
| 13556 | 2.104 | 0.004 | 0.029 | 0.000 | HIGH |
| 13557 | 1.921 | 0.004 | 0.016 | 0.000 | HIGH |
| 13558 | 1.920 | 0.004 | 0.024 | 0.000 | HIGH |
| 13559 | 1.866 | 0.004 | 0.104 | 0.001 | HIGH |
| 13561 | 3.624 | 0.007 | 0.022 | 0.000 | HIGH |
| 13562 | 3.406 | 0.006 | 0.016 | 0.000 | HIGH |
| 13563 | 2.836 | 0.005 | 0.024 | 0.000 | HIGH |

5.5.69

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13564 | 2.337 | 0.004 | 0.023 | 0.000 | HIGH |
| 13565 | 1.932 | 0.004 | 0.021 | 0.000 | HIGH |
| 13566 | 1.645 | 0.003 | 0.011 | 0.000 | HIGH |
| 13567 | 1.251 | 0.002 | 0.004 | 0.000 | HIGH |
| 13568 | 2.627 | 0.005 | 0.012 | 0.000 | HIGH |
| 13569 | 3.089 | 0.006 | 0.012 | 0.000 | HIGH |
| 13570 | 2.917 | 0.006 | 0.015 | 0.000 | HIGH |
| 13571 | 2.486 | 0.005 | 0.022 | 0.000 | HIGH |
| 13572 | 2.004 | 0.004 | 0.022 | 0.000 | HIGH |
| 13573 | 1.594 | 0.003 | 0.018 | 0.000 | HIGH |
| 13574 | 1.098 | 0.002 | 0.032 | 0.000 | HIGH |
| 13575 | 2.611 | 0.005 | 0.002 | 0.000 | HIGH |
| 13576 | 2.706 | 0.005 | 0.011 | 0.000 | HIGH |
| 13577 | 2.507 | 0.005 | 0.023 | 0.000 | HIGH |
| 13578 | 2.035 | 0.004 | 0.024 | 0.000 | HIGH |
| 13579 | 1.579 | 0.003 | 0.023 | 0.000 | HIGH |
| 13580 | 1.161 | 0.002 | 0.031 | 0.000 | HIGH |
| 13581 | 2.593 | 0.005 | 0.011 | 0.000 | HIGH |
| 13582 | 2.468 | 0.005 | 0.028 | 0.000 | HIGH |
| 13583 | 2.002 | 0.004 | 0.031 | 0.000 | HIGH |
| 13584 | 1.398 | 0.003 | 0.030 | 0.000 | HIGH |
| 13585 | 0.978 | 0.002 | 0.029 | 0.000 | HIGH |
| 13586 | 2.533 | 0.005 | 0.030 | 0.000 | HIGH |
| 13587 | 1.953 | 0.004 | 0.051 | 0.000 | HIGH |
| 13588 | 1.090 | 0.002 | 0.048 | 0.000 | HIGH |
| 13589 | 0.445 | 0.001 | 0.027 | 0.000 | HIGH |
| 13590 | 1.428 | 0.003 | 0.101 | 0.001 | HIGH |
| 13591 | 0.551 | 0.001 | 0.086 | 0.001 | HIGH |
| 13592 | -0.369 | 0.001 | 0.037 | 0.000 | HIGH |
| 13594 | -2.501 | 0.005 | 0.101 | 0.001 | HIGH |
| 22201 | 0.301 | 0.001 | 0.238 | 0.002 | HIGH |
| 22202 | -4.894 | 0.009 | 0.163 | 0.001 | HIGH |
| 22203 | -5.749 | 0.011 | 0.049 | 0.000 | HIGH |
| 22204 | 2.866 | 0.005 | 0.088 | 0.001 | HIGH |
| 22205 | -1.416 | 0.003 | 2.069 | 0.013 | HIGH |
| 22206 | 0.292 | 0.001 | 1.833 | 0.012 | HIGH |
| 22207 | 3.035 | 0.006 | 1.851 | 0.012 | HIGH |
| 22208 | -1.764 | 0.003 | 3.514 | 0.022 | HIGH |
| 22215 | -0.074 | 0.000 | 0.228 | 0.001 | HIGH |
| 22216 | 1.446 | 0.003 | 0.147 | 0.001 | HIGH |
| 22222 | 2.835 | 0.005 | 4.831 | 0.031 | HIGH |
| 22223 | 7.977 | 0.015 | 6.943 | 0.044 | HIGH |
| 22224 | 0.139 | 0.000 | 0.365 | 0.002 | HIGH |
| 22225 | 1.470 | 0.003 | 0.156 | 0.001 | HIGH |
| 22226 | 1.473 | 0.003 | 0.090 | 0.001 | HIGH |

041:5:5

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22227 | 0.941 | 0.002 | 0.344 | 0.002 | HIGH |
| 22228 | 0.428 | 0.001 | 0.778 | 0.005 | HIGH |
| 22229 | -0.029 | 0.000 | 1.594 | 0.010 | HIGH |
| 22230 | 0.512 | 0.001 | 1.922 | 0.012 | HIGH |
| 22231 | 2.401 | 0.005 | 7.280 | 0.046 | HIGH |
| 22232 | 6.387 | 0.012 | 10.235 | 0.065 | HIGH |
| 22233 | 5.493 | 0.010 | 15.265 | 0.097 | HIGH |
| 22234 | -0.858 | 0.002 | 0.568 | 0.004 | HIGH |
| 22235 | 1.010 | 0.002 | 0.155 | 0.001 | HIGH |
| 22236 | 1.468 | 0.003 | 0.087 | 0.001 | HIGH |
| 22237 | 1.291 | 0.002 | 0.380 | 0.002 | HIGH |
| 22238 | 0.885 | 0.002 | 0.967 | 0.006 | HIGH |
| 22239 | 0.716 | 0.001 | 1.849 | 0.012 | HIGH |
| 22240 | 1.122 | 0.002 | 2.038 | 0.013 | HIGH |
| 22241 | 1.965 | 0.004 | 2.696 | 0.017 | HIGH |
| 22242 | 2.945 | 0.006 | 28.828 | 0.184 | HIGH |
| 22243 | 0.305 | 0.001 | 0.230 | 0.001 | HIGH |
| 22244 | 3.186 | 0.006 | 42.721 | 0.273 | 8.18 |
| 22245 | -0.281 | 0.001 | 0.190 | 0.001 | HIGH |
| 22246 | -1.563 | 0.003 | 0.095 | 0.001 | HIGH |
| 22247 | 1.927 | 0.004 | 0.164 | 0.001 | HIGH |
| 22248 | 1.438 | 0.003 | 0.199 | 0.001 | HIGH |
| 22249 | 0.877 | 0.002 | 0.563 | 0.004 | HIGH |
| 22250 | 0.706 | 0.001 | 1.333 | 0.009 | HIGH |
| 22251 | 1.202 | 0.002 | 1.810 | 0.012 | HIGH |
| 22252 | 1.799 | 0.003 | 2.060 | 0.013 | HIGH |
| 22253 | 2.680 | 0.005 | 6.342 | 0.040 | HIGH |
| 22254 | 2.770 | 0.005 | 18.247 | 0.117 | HIGH |
| 22255 | -5.230 | 0.010 | 22.022 | 0.141 | HIGH |
| 22256 | -3.797 | 0.007 | 3.436 | 0.022 | HIGH |
| 22257 | -0.629 | 0.001 | 0.164 | 0.001 | HIGH |
| 22258 | 0.128 | 0.000 | 0.023 | 0.000 | HIGH |
| 22259 | -0.395 | 0.001 | 0.111 | 0.001 | HIGH |
| 22260 | 1.240 | 0.002 | 0.109 | 0.001 | HIGH |
| 22261 | 0.363 | 0.001 | 0.221 | 0.001 | HIGH |
| 22262 | -0.022 | 0.000 | 0.243 | 0.002 | HIGH |
| 22263 | 1.012 | 0.002 | 0.814 | 0.005 | HIGH |
| 22264 | 0.976 | 0.002 | 0.887 | 0.006 | HIGH |
| 22265 | 0.968 | 0.002 | 0.900 | 0.006 | HIGH |
| 22266 | 0.056 | 0.000 | 5.236 | 0.033 | HIGH |
| 22267 | -1.872 | 0.004 | 8.700 | 0.056 | HIGH |
| 22268 | -1.755 | 0.003 | 5.649 | 0.036 | HIGH |
| 22269 | -2.885 | 0.005 | 1.613 | 0.010 | HIGH |
| 22270 | 2.605 | 0.005 | 0.249 | 0.002 | HIGH |
| 22271 | 2.072 | 0.004 | 0.121 | 0.001 | HIGH |

17.5.5

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22272 | 2.687 | 0.005 | 0.168 | 0.001 | HIGH |
| 22273 | 1.149 | 0.002 | 0.119 | 0.001 | HIGH |
| 22274 | 0.513 | 0.001 | 0.041 | 0.000 | HIGH |
| 22275 | -3.755 | 0.007 | 0.109 | 0.001 | HIGH |
| 22278 | 2.447 | 0.005 | 0.389 | 0.002 | HIGH |
| 22279 | 5.110 | 0.010 | 0.173 | 0.001 | HIGH |
| 22280 | 2.033 | 0.004 | 0.197 | 0.001 | HIGH |
| 22281 | 1.585 | 0.003 | 0.104 | 0.001 | HIGH |
| 22282 | 1.823 | 0.003 | 0.045 | 0.000 | HIGH |
| 22283 | -1.981 | 0.004 | 0.138 | 0.001 | HIGH |
| 22286 | 4.376 | 0.008 | 0.224 | 0.001 | HIGH |
| 22287 | 2.179 | 0.004 | 0.200 | 0.001 | HIGH |
| 22288 | 2.675 | 0.005 | 0.130 | 0.001 | HIGH |
| 22289 | 2.865 | 0.005 | 0.102 | 0.001 | HIGH |
| 22290 | 3.386 | 0.006 | 0.154 | 0.001 | HIGH |
| 22293 | 2.338 | 0.004 | 0.602 | 0.004 | HIGH |
| 22294 | 3.313 | 0.006 | 0.109 | 0.001 | HIGH |
| 22295 | 3.890 | 0.007 | 0.190 | 0.001 | HIGH |
| 22296 | 4.310 | 0.008 | 0.271 | 0.002 | HIGH |
| 22297 | 5.302 | 0.010 | 0.295 | 0.002 | HIGH |
| 22300 | 4.687 | 0.009 | 0.146 | 0.001 | HIGH |
| 22301 | 5.130 | 0.010 | 0.075 | 0.000 | HIGH |
| 22302 | 5.319 | 0.010 | 0.567 | 0.004 | HIGH |
| 22303 | 5.501 | 0.010 | 0.930 | 0.006 | HIGH |
| 22304 | 5.935 | 0.011 | 0.992 | 0.006 | HIGH |
| 22308 | 5.742 | 0.011 | 0.425 | 0.003 | HIGH |
| 22309 | 6.755 | 0.013 | 0.957 | 0.006 | HIGH |
| 22310 | 6.274 | 0.012 | 1.614 | 0.010 | HIGH |
| 22311 | 5.879 | 0.011 | 2.162 | 0.014 | HIGH |
| 22312 | 5.019 | 0.009 | 2.791 | 0.018 | HIGH |
| 22316 | 6.983 | 0.013 | 2.028 | 0.013 | HIGH |
| 22317 | 7.092 | 0.013 | 1.987 | 0.013 | HIGH |
| 22318 | 6.513 | 0.012 | 3.734 | 0.024 | HIGH |
| 22319 | 5.682 | 0.011 | 4.099 | 0.026 | HIGH |
| 22320 | 4.044 | 0.008 | 3.840 | 0.025 | HIGH |
| 22323 | 7.689 | 0.015 | 3.553 | 0.023 | HIGH |
| 22324 | 7.773 | 0.015 | 3.339 | 0.021 | HIGH |
| 22325 | 6.919 | 0.013 | 8.202 | 0.052 | HIGH |
| 22326 | 5.963 | 0.011 | 10.588 | 0.068 | HIGH |
| 22327 | 2.418 | 0.005 | 3.780 | 0.024 | HIGH |
| 22329 | 8.400 | 0.016 | 8.394 | 0.054 | HIGH |
| 22330 | 9.422 | 0.018 | 8.324 | 0.053 | HIGH |
| 22331 | 9.371 | 0.018 | 17.103 | 0.109 | HIGH |
| 22332 | 6.469 | 0.012 | 17.555 | 0.112 | HIGH |
| 22333 | 2.969 | 0.006 | 3.866 | 0.025 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22334 | 8.599 | 0.016 | 13.078 | 0.084 | HIGH |
| 22335 | 10.679 | 0.020 | 32.708 | 0.209 | HIGH |
| 22336 | 1.617 | 0.003 | 0.021 | 0.000 | HIGH |
| 22337 | 13.896 | 0.026 | 34.207 | 0.218 | 9.42 |
| 22338 | 5.626 | 0.011 | 9.061 | 0.058 | HIGH |
| 22339 | 5.496 | 0.010 | 13.347 | 0.085 | HIGH |
| 22340 | 12.201 | 0.023 | 2.702 | 0.017 | HIGH |
| 22341 | 2.853 | 0.005 | 1.177 | 0.008 | HIGH |
| 22342 | 4.180 | 0.008 | 1.603 | 0.010 | HIGH |
| 22343 | 0.791 | 0.001 | 0.517 | 0.003 | HIGH |
| 22346 | -0.970 | 0.002 | 5.662 | 0.036 | HIGH |
| 22347 | -3.336 | 0.006 | 16.510 | 0.105 | HIGH |
| 22348 | 0.560 | 0.001 | 5.139 | 0.033 | HIGH |
| 22349 | -1.489 | 0.003 | 14.123 | 0.090 | HIGH |
| 22350 | -2.188 | 0.004 | 2.996 | 0.019 | HIGH |
| 22351 | -0.965 | 0.002 | 0.770 | 0.005 | HIGH |
| 22353 | 0.967 | 0.002 | 11.231 | 0.072 | HIGH |
| 22354 | -2.809 | 0.005 | 3.783 | 0.024 | HIGH |
| 22355 | -6.741 | 0.013 | 15.288 | 0.098 | HIGH |
| 22356 | -0.884 | 0.002 | 0.030 | 0.000 | HIGH |
| 22357 | -3.120 | 0.006 | 15.688 | 0.100 | HIGH |
| 22358 | -3.203 | 0.006 | 6.235 | 0.040 | HIGH |
| 22361 | -3.195 | 0.006 | 7.096 | 0.045 | HIGH |
| 22362 | -4.959 | 0.009 | 5.387 | 0.034 | HIGH |
| 22363 | -5.924 | 0.011 | 7.744 | 0.049 | HIGH |
| 22364 | -5.992 | 0.011 | 6.784 | 0.043 | HIGH |
| 22365 | -3.962 | 0.007 | 12.107 | 0.077 | HIGH |
| 22368 | -5.400 | 0.010 | 3.554 | 0.023 | HIGH |
| 22369 | -5.665 | 0.011 | 2.166 | 0.014 | HIGH |
| 22370 | -6.486 | 0.012 | 5.664 | 0.036 | HIGH |
| 22371 | -7.351 | 0.014 | 5.846 | 0.037 | HIGH |
| 22372 | -6.343 | 0.012 | 11.130 | 0.071 | HIGH |
| 22375 | -7.094 | 0.013 | 1.517 | 0.010 | HIGH |
| 22376 | -6.619 | 0.012 | 1.450 | 0.009 | HIGH |
| 22377 | -7.006 | 0.013 | 2.844 | 0.018 | HIGH |
| 22378 | -7.587 | 0.014 | 3.084 | 0.020 | HIGH |
| 22379 | -7.516 | 0.014 | 6.001 | 0.038 | HIGH |
| 22383 | -7.692 | 0.015 | 0.547 | 0.003 | HIGH |
| 22384 | -7.327 | 0.014 | 0.565 | 0.004 | HIGH |
| 22385 | -7.147 | 0.013 | 1.157 | 0.007 | HIGH |
| 22386 | -7.631 | 0.014 | 1.241 | 0.008 | HIGH |
| 22387 | -7.537 | 0.014 | 2.288 | 0.015 | HIGH |
| 22390 | -7.929 | 0.015 | 0.155 | 0.001 | HIGH |
| 22391 | -7.560 | 0.014 | 0.152 | 0.001 | HIGH |
| 22392 | -7.146 | 0.013 | 0.403 | 0.003 | HIGH |

5.5.174

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22393 | -6.971 | 0.013 | 0.600 | 0.004 | HIGH |
| 22394 | -7.186 | 0.014 | 0.702 | 0.004 | HIGH |
| 22396 | -6.928 | 0.013 | 0.025 | 0.000 | HIGH |
| 22397 | -7.181 | 0.014 | 0.026 | 0.000 | HIGH |
| 22398 | -6.998 | 0.013 | 0.169 | 0.001 | HIGH |
| 22399 | -6.434 | 0.012 | 0.266 | 0.002 | HIGH |
| 22400 | -5.976 | 0.011 | 0.302 | 0.002 | HIGH |
| 22401 | -5.188 | 0.010 | 0.092 | 0.001 | HIGH |
| 22402 | -6.263 | 0.012 | 0.095 | 0.001 | HIGH |
| 22403 | -6.709 | 0.013 | 0.130 | 0.001 | HIGH |
| 22404 | -6.217 | 0.012 | 0.219 | 0.001 | HIGH |
| 22405 | -5.286 | 0.010 | 0.266 | 0.002 | HIGH |
| 22406 | -5.300 | 0.010 | 0.246 | 0.002 | HIGH |
| 22407 | -6.931 | 0.013 | 0.204 | 0.001 | HIGH |
| 22408 | -5.752 | 0.011 | 0.170 | 0.001 | HIGH |
| 22409 | -6.117 | 0.012 | 0.526 | 0.003 | HIGH |
| 22410 | -3.532 | 0.007 | 0.639 | 0.004 | HIGH |
| 22411 | -3.953 | 0.007 | 0.156 | 0.001 | HIGH |
| 22412 | -6.923 | 0.013 | 0.487 | 0.003 | HIGH |
| 22413 | -2.851 | 0.005 | 0.402 | 0.003 | HIGH |
| 22414 | -3.364 | 0.006 | 0.140 | 0.001 | HIGH |
| 22415 | -1.169 | 0.002 | 0.132 | 0.001 | HIGH |
| 23301 | 0.765 | 0.001 | 0.209 | 0.001 | HIGH |
| 23302 | -2.973 | 0.006 | 0.098 | 0.001 | HIGH |
| 23303 | -4.007 | 0.008 | 0.026 | 0.000 | HIGH |
| 23304 | 3.278 | 0.006 | 0.079 | 0.001 | HIGH |
| 23305 | -4.536 | 0.009 | 0.049 | 0.000 | HIGH |
| 23306 | 4.157 | 0.008 | 0.013 | 0.000 | HIGH |
| 23307 | -2.270 | 0.004 | 0.066 | 0.000 | HIGH |
| 23308 | 4.515 | 0.009 | 0.048 | 0.000 | HIGH |
| 23313 | 1.671 | 0.003 | 0.071 | 0.000 | HIGH |
| 23314 | 2.089 | 0.004 | 0.116 | 0.001 | HIGH |
| 23319 | -3.535 | 0.007 | 0.044 | 0.000 | HIGH |
| 23320 | -3.427 | 0.006 | 0.026 | 0.000 | HIGH |
| 23321 | 2.449 | 0.005 | 0.082 | 0.001 | HIGH |
| 23322 | 2.798 | 0.005 | 0.095 | 0.001 | HIGH |
| 23323 | 2.595 | 0.005 | 0.089 | 0.001 | HIGH |
| 23324 | -2.394 | 0.005 | 0.102 | 0.001 | HIGH |
| 23327 | 1.118 | 0.002 | 0.081 | 0.001 | HIGH |
| 23328 | -3.222 | 0.006 | 0.048 | 0.000 | HIGH |
| 23329 | -4.392 | 0.008 | 0.038 | 0.000 | HIGH |
| 23330 | -4.746 | 0.009 | 0.017 | 0.000 | HIGH |
| 23331 | 2.252 | 0.004 | 0.092 | 0.001 | HIGH |
| 23332 | 2.060 | 0.004 | 0.075 | 0.000 | HIGH |
| 23333 | 2.542 | 0.005 | 0.125 | 0.001 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23334 | -0.019 | 0.000 | 0.277 | 0.002 | HIGH |
| 23338 | -1.440 | 0.003 | 0.203 | 0.001 | HIGH |
| 23339 | -3.801 | 0.007 | 0.069 | 0.000 | HIGH |
| 23340 | -3.643 | 0.007 | 0.028 | 0.000 | HIGH |
| 23341 | -4.232 | 0.008 | 0.011 | 0.000 | HIGH |
| 23342 | 1.624 | 0.003 | 0.088 | 0.001 | HIGH |
| 23343 | 1.441 | 0.003 | 0.056 | 0.000 | HIGH |
| 23344 | 1.621 | 0.003 | 0.146 | 0.001 | HIGH |
| 23345 | 1.406 | 0.003 | 0.327 | 0.002 | HIGH |
| 23350 | -2.346 | 0.004 | 0.202 | 0.001 | HIGH |
| 23351 | -2.419 | 0.005 | 0.080 | 0.001 | HIGH |
| 23352 | -2.684 | 0.005 | 0.018 | 0.000 | HIGH |
| 23353 | -3.528 | 0.007 | 0.020 | 0.000 | HIGH |
| 23354 | 0.265 | 0.001 | 0.065 | 0.000 | HIGH |
| 23355 | 0.827 | 0.002 | 0.040 | 0.000 | HIGH |
| 23356 | 1.382 | 0.003 | 0.125 | 0.001 | HIGH |
| 23357 | 0.969 | 0.002 | 0.181 | 0.001 | HIGH |
| 23363 | -0.784 | 0.001 | 0.177 | 0.001 | HIGH |
| 23364 | -1.656 | 0.003 | 0.027 | 0.000 | HIGH |
| 23365 | -2.058 | 0.004 | 0.025 | 0.000 | HIGH |
| 23366 | -2.821 | 0.005 | 0.024 | 0.000 | HIGH |
| 23367 | -1.204 | 0.002 | 0.053 | 0.000 | HIGH |
| 23368 | 0.112 | 0.000 | 0.045 | 0.000 | HIGH |
| 23369 | 1.169 | 0.002 | 0.098 | 0.001 | HIGH |
| 23370 | 1.616 | 0.003 | 0.154 | 0.001 | HIGH |
| 23371 | 0.264 | 0.000 | 0.178 | 0.001 | HIGH |
| 23376 | 0.872 | 0.002 | 0.191 | 0.001 | HIGH |
| 23377 | -0.694 | 0.001 | 0.035 | 0.000 | HIGH |
| 23378 | -1.226 | 0.002 | 0.028 | 0.000 | HIGH |
| 23379 | -1.536 | 0.003 | 0.022 | 0.000 | HIGH |
| 23380 | -2.114 | 0.004 | 0.030 | 0.000 | HIGH |
| 23382 | 0.384 | 0.001 | 0.041 | 0.000 | HIGH |
| 23383 | 0.740 | 0.001 | 0.051 | 0.000 | HIGH |
| 23384 | 1.646 | 0.003 | 0.114 | 0.001 | HIGH |
| 23385 | 1.356 | 0.003 | 0.135 | 0.001 | HIGH |
| 23386 | 0.431 | 0.001 | 0.095 | 0.001 | HIGH |
| 23390 | 0.444 | 0.001 | 0.144 | 0.001 | HIGH |
| 23391 | 0.246 | 0.000 | 0.032 | 0.000 | HIGH |
| 23392 | -0.359 | 0.001 | 0.022 | 0.000 | HIGH |
| 23393 | -0.634 | 0.001 | 0.017 | 0.000 | HIGH |
| 23394 | -0.918 | 0.002 | 0.017 | 0.000 | HIGH |
| 23395 | -1.269 | 0.002 | 0.023 | 0.000 | HIGH |
| 23397 | 3.998 | 0.008 | 0.039 | 0.000 | HIGH |
| 23398 | 2.161 | 0.004 | 0.025 | 0.000 | HIGH |
| 23399 | 1.016 | 0.002 | 0.016 | 0.000 | HIGH |

54-5-5

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23400 | 0.459 | 0.001 | 0.016 | 0.000 | HIGH |
| 23401 | -0.221 | 0.000 | 0.023 | 0.000 | HIGH |
| 23402 | -1.495 | 0.003 | 0.020 | 0.000 | HIGH |
| 23403 | -4.217 | 0.008 | 0.126 | 0.001 | HIGH |
| 23406 | 2.814 | 0.005 | 0.066 | 0.000 | HIGH |
| 23407 | 2.821 | 0.005 | 0.075 | 0.000 | HIGH |
| 23408 | 1.781 | 0.003 | 0.067 | 0.000 | HIGH |
| 23409 | 1.239 | 0.002 | 0.030 | 0.000 | HIGH |
| 23410 | 1.070 | 0.002 | 0.045 | 0.000 | HIGH |
| 23411 | 0.600 | 0.001 | 0.053 | 0.000 | HIGH |
| 23412 | 0.332 | 0.001 | 0.064 | 0.000 | HIGH |
| 23413 | -3.129 | 0.006 | 0.043 | 0.000 | HIGH |
| 23415 | 2.444 | 0.005 | 0.187 | 0.001 | HIGH |
| 23416 | 2.020 | 0.004 | 0.155 | 0.001 | HIGH |
| 23417 | 1.587 | 0.003 | 0.090 | 0.001 | HIGH |
| 23418 | 2.008 | 0.004 | 0.047 | 0.000 | HIGH |
| 23419 | 2.231 | 0.004 | 0.062 | 0.000 | HIGH |
| 23420 | 2.224 | 0.004 | 0.085 | 0.001 | HIGH |
| 23421 | 4.175 | 0.008 | 0.104 | 0.001 | HIGH |
| 23424 | 0.588 | 0.001 | 0.315 | 0.002 | HIGH |
| 23425 | 1.213 | 0.002 | 0.269 | 0.002 | HIGH |
| 23426 | 2.571 | 0.005 | 0.041 | 0.000 | HIGH |
| 23432 | -0.768 | 0.001 | 0.720 | 0.005 | HIGH |
| 23433 | 0.273 | 0.001 | 0.293 | 0.002 | HIGH |
| 23440 | -0.671 | 0.001 | 0.677 | 0.004 | HIGH |
| 23450 | -0.147 | 0.000 | 1.189 | 0.008 | HIGH |
| 23455 | 2.933 | 0.006 | 0.185 | 0.001 | HIGH |
| 23456 | 5.614 | 0.011 | 0.048 | 0.000 | HIGH |
| 23457 | 0.869 | 0.002 | 0.039 | 0.000 | HIGH |
| 23463 | 5.675 | 0.011 | 0.102 | 0.001 | HIGH |
| 23464 | 6.133 | 0.012 | 0.091 | 0.001 | HIGH |
| 23465 | 6.910 | 0.013 | 0.031 | 0.000 | HIGH |
| 23467 | -0.344 | 0.001 | 0.548 | 0.003 | HIGH |
| 23470 | 5.508 | 0.010 | 0.085 | 0.001 | HIGH |
| 23471 | 5.599 | 0.011 | 0.084 | 0.001 | HIGH |
| 23472 | 5.456 | 0.010 | 0.037 | 0.000 | HIGH |
| 23473 | 4.930 | 0.009 | 0.040 | 0.000 | HIGH |
| 23474 | 0.366 | 0.001 | 0.453 | 0.003 | HIGH |
| 23475 | 1.480 | 0.003 | 0.076 | 0.000 | HIGH |
| 23476 | 3.054 | 0.006 | 0.045 | 0.000 | HIGH |
| 23477 | 3.939 | 0.007 | 0.050 | 0.000 | HIGH |
| 23478 | 4.218 | 0.008 | 0.049 | 0.000 | HIGH |
| 23479 | 3.998 | 0.008 | 0.019 | 0.000 | HIGH |
| 23480 | 1.335 | 0.003 | 0.374 | 0.002 | HIGH |
| 23481 | 2.153 | 0.004 | 0.097 | 0.001 | HIGH |

5.5.176

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23482 | 2.701 | 0.005 | 0.045 | 0.000 | HIGH |
| 23483 | 3.118 | 0.006 | 0.043 | 0.000 | HIGH |
| 23484 | 3.275 | 0.006 | 0.038 | 0.000 | HIGH |
| 23485 | 1.439 | 0.003 | 0.301 | 0.002 | HIGH |
| 23486 | 1.873 | 0.004 | 0.084 | 0.001 | HIGH |
| 23487 | 2.201 | 0.004 | 0.041 | 0.000 | HIGH |
| 23488 | 2.434 | 0.005 | 0.044 | 0.000 | HIGH |
| 23489 | 1.086 | 0.002 | 0,206 | 0.001 | HIGH |
| 23490 | 1.445 | 0.003 | 0.051 | 0.000 | HIGH |
| 23491 | 1.647 | 0.003 | 0.056 | 0.000 | HIGH |
| 23492 | 0.808 | 0.002 | 0.084 | 0.001 | HIGH |
| 23493 | 0.955 | 0.002 | 0.048 | 0.000 | HIGH |
| 23494 | 0.264 | 0.000 | 0.031 | 0.000 | HIGH |
| 23499 | 3.347 | 0.006 | 0.020 | 0.000 | HIGH |
| 23500 | 0.842 | 0.002 | 0.024 | 0.000 | HIGH |
| 23501 | 0.001 | 0.000 | 0.028 | 0.000 | HIGH |
| 23502 | -0.385 | 0.001 | 0.021 | 0.000 | HIGH |
| 23503 | -0.338 | 0.001 | 0.011 | 0.000 | HIGH |
| 23504 | -0.170 | 0.000 | 0.027 | 0.000 | HIGH |
| 23505 | 0.028 | 0.000 | 0.028 | 0.000 | HIGH |
| 23506 | 0.228 | 0.000 | 0.023 | 0.000 | HIGH |
| 23509 | -1.979 | 0.004 | 0.039 | 0.000 | HIGH |
| 23510 | -1.411 | 0.003 | 0.045 | 0.000 | HIGH |
| 23511 | -1.559 | 0.003 | 0.047 | 0.000 | HIGH |
| 23512 | -1.286 | 0.002 | 0.037 | 0.000 | HIGH |
| 23513 | -0.875 | 0.002 | 0.053 | 0.000 | HIGH |
| 23514 | -0.555 | 0.001 | 0.060 | 0.000 | HIGH |
| 23515 | -0.160 | 0.000 | 0.066 | 0.000 | HIGH |
| 23518 | -4.335 | 0.008 | 0.091 | 0.001 | HIGH |
| 23519 | -2.488 | 0.005 | 0.070 | 0.000 | HIGH |
| 23520 | -2.905 | 0.005 | 0.053 | 0.000 | HIGH |
| 23521 | -2.824 | 0.005 | 0.052 | 0.000 | HIGH |
| 23522 | -1.945 | 0.004 | 0.049 | 0.000 | HIGH |
| 23523 | -1.403 | 0.003 | 0.126 | 0.001 | HIGH |
| 23524 | -0.951 | 0.002 | 0.133 | 0.001 | HIGH |
| 23530 | -4.019 | 0.008 | 0.105 | 0.001 | HIGH |
| 23531 | -2.449 | 0.005 | 0.182 | 0.001 | HIGH |
| 23532 | -1.650 | 0.003 | 0.226 | 0.001 | HIGH |
| 23539 | -2.472 | 0.005 | 0.205 | 0.001 | HIGH |
| 23540 | -1.712 | 0.003 | 0.396 | 0.003 | HIGH |
| 23550 | -0.845 | 0.002 | 0.745 | 0.005 | HIGH |
| 23553 | -6.624 | 0.012 | 0.041 | 0.000 | HIGH |
| 23554 | -3.367 | 0.006 | 0.249 | 0.002 | HIGH |
| 23559 | 0.264 | 0.000 | 0.456 | 0.003 | HIGH |
| 23561 | -6.018 | 0.011 | 0.070 | 0.000 | HIGH |

47.5.5

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23562 | -6.045 | 0.011 | 0.117 | 0.001 | HIGH |
| 23563 | -5.244 | 0.010 | 0.125 | 0.001 | HIGH |
| 23568 | -3.678 | 0.007 | 0.117 | 0.001 | HIGH |
| 23569 | -4.522 | 0.009 | 0.056 | 0.000 | HIGH |
| 23570 | -4.987 | 0.009 | 0.150 | 0.001 | HIGH |
| 23571 | -4.755 | 0.009 | 0.165 | 0.001 | HIGH |
| 23574 | -0.300 | 0.001 | 0.332 | 0.002 | HIGH |
| 23575 | -3.257 | 0.006 | 0.147 | 0.001 | HIGH |
| 23576 | -3.621 | 0.007 | 0.057 | 0.000 | HIGH |
| 23577 | -3.785 | 0.007 | 0.114 | 0.001 | HIGH |
| 23578 | -3.358 | 0.006 | 0.112 | 0.001 | HIGH |
| 23579 | -1.996 | 0.004 | 0.138 | 0.001 | HIGH |
| 23580 | -1.004 | 0.002 | 0.269 | 0.002 | HIGH |
| 23581 | -2.696 | 0.005 | 0.149 | 0.001 | HIGH |
| 23582 | -2.960 | 0.006 | 0.069 | 0.000 | HIGH |
| 23583 | -3.495 | 0.007 | 0.117 | 0.001 | HIGH |
| 23584 | -3.922 | 0.007 | 0.227 | 0.001 | HIGH |
| 23585 | -3.425 | 0.006 | 0.626 | 0.004 | HIGH |
| 23586 | -1.868 | 0.004 | 0.137 | 0.001 | HIGH |
| 23587 | -2.658 | 0.005 | 0.106 | 0.001 | HIGH |
| 23588 | -3.692 | 0.007 | 0.199 | 0.001 | HIGH |
| 23589 | -4.192 | 0.008 | 0.601 | 0.004 | HIGH |
| 23590 | -1.377 | 0.003 | 0.099 | 0.001 | HIGH |
| 23591 | -2.721 | 0.005 | 0.152 | 0.001 | HIGH |
| 23592 | -2.701 | 0.005 | 0.240 | 0.002 | HIGH |
| 23594 | -3.052 | 0.006 | 0.116 | 0.001 | HIGH |
| 32201 | -5.504 | 0.010 | 0.424 | 0.003 | HIGH |
| 32202 | 2.340 | 0.004 | 0.307 | 0.002 | HIGH |
| 32204 | -1.939 | 0.004 | 0.007 | 0.000 | HIGH |
| 32205 | 0.544 | 0.001 | 0.005 | 0.000 | HIGH |
| 32206 | 0.558 | 0.001 | 0.033 | 0.000 | HIGH |
| 32207 | 1.616 | 0.003 | 0.099 | 0.001 | HIGH |
| 32208 | 0.331 | 0.001 | 0.043 | 0.000 | HIGH |
| 32215 | -13.195 | 0.025 | 0.288 | 0.002 | HIGH |
| 32216 | -7.686 | 0.015 | 0.068 | 0.000 | HIGH |
| 32222 | 0.957 | 0.002 | 0.027 | 0.000 | HIGH |
| 32223 | 1.704 | 0.003 | 0.027 | 0.000 | HIGH |
| 32224 | -12.826 | 0.024 | 2.359 | 0.015 | HIGH |
| 32225 | -11.456 | 0.022 | 0.592 | 0.004 | HIGH |
| 32226 | -4.030 | 0.008 | 0.010 | 0.000 | HIGH |
| 32227 | -0.798 | 0.002 | 0.070 | 0.000 | HIGH |
| 32228 | -0.583 | 0.001 | 0.022 | 0.000 | HIGH |
| 32229 | -0.319 | 0.001 | 0.071 | 0.000 | HIGH |
| 32230 | -0.056 | 0.000 | 0.034 | 0.000 | HIGH |
| 32231 | 0.262 | 0.000 | 0.014 | 0.000 | HIGH |

87-5-5-178

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32232 | 0.752 | 0.001 | 0.022 | 0.000 | HIGH |
| 32233 | 1.270 | 0.002 | 0.205 | 0.001 | HIGH |
| 32234 | -10.770 | 0.020 | 1.872 | 0.012 | HIGH |
| 32235 | -3.778 | 0.007 | 0.928 | 0.006 | HIGH |
| 32236 | -4.127 | 0.008 | 0.027 | 0.000 | HIGH |
| 32237 | -2.987 | 0.006 | 0.034 | 0.000 | HIGH |
| 32238 | -1.241 | 0.002 | 0.031 | 0.000 | HIGH |
| 32239 | -0.895 | 0.002 | 0.029 | 0.000 | HIGH |
| 32240 | -0.608 | 0.001 | 0.023 | 0.000 | HIGH |
| 32241 | -0.276 | 0.001 | 0.021 | 0.000 | HIGH |
| 32242 | 0.038 | 0.000 | 0.022 | 0.000 | HIGH |
| 32243 | 0.223 | 0.000 | 0.030 | 0.000 | HIGH |
| 32244 | 0.961 | 0.002 | 0.137 | 0.001 | HIGH |
| 32245 | -1.684 | 0.003 | 0.595 | 0.004 | HIGH |
| 32246 | -2.003 | 0.004 | 0.540 | 0.003 | HIGH |
| 32247 | -2.727 | 0.005 | 0.077 | 0.000 | HIGH |
| 32248 | -2.444 | 0.005 | 0.042 | 0.000 | HIGH |
| 32249 | -1.145 | 0.002 | 0.070 | 0.000 | HIGH |
| 32250 | -1.132 | 0.002 | 0.067 | 0.000 | HIGH |
| 32251 | -0.803 | 0.002 | 0.034 | 0.000 | HIGH |
| 32252 | -0.580 | 0.001 | 0.053 | 0.000 | HIGH |
| 32253 | -0.306 | 0.001 | 0.053 | 0.000 | HIGH |
| 32254 | 0.114 | 0.000 | 0.045 | 0.000 | HIGH |
| 32255 | 0.183 | 0.000 | 0.019 | 0.000 | HIGH |
| 32256 | 0.384 | 0.001 | 0.111 | 0.001 | HIGH |
| 32257 | -1.172 | 0.002 | 0.392 | 0.003 | HIGH |
| 32258 | -0.177 | 0.000 | 0.069 | 0.000 | HIGH |
| 32259 | -0.713 | 0.001 | 0.143 | 0.001 | HIGH |
| 32260 | -1.196 | 0.002 | 0.213 | 0.001 | HIGH |
| 32261 | -0.695 | 0.001 | 0.621 | 0.004 | HIGH |
| 32262 | -0.819 | 0.002 | 0.121 | 0.001 | HIGH |
| 32263 | -0.682 | 0.001 | 0.057 | 0.000 | HIGH |
| 32264 | -0.492 | 0.001 | 0.035 | 0.000 | HIGH |
| 32265 | -0.535 | 0.001 | 0.072 | 0.000 | HIGH |
| 32266 | -0.223 | 0.000 | 0.054 | 0.000 | HIGH |
| 32267 | -0.013 | 0.000 | 0.019 | 0.000 | HIGH |
| 32268 | 0.191 | 0.000 | 0.033 | 0.000 | HIGH |
| 32269 | 0.223 | 0.000 | 0.038 | 0.000 | HIGH |
| 32270 | 2.346 | 0.004 | 0.620 | 0.004 | HIGH |
| 32271 | 1.533 | 0.003 | 0.055 | 0.000 | HIGH |
| 32272 | 1.608 | 0.003 | 0.195 | 0.001 | HIGH |
| 32273 | 0.906 | 0.002 | 0.218 | 0.001 | HIGH |
| 32274 | 2.382 | 0.004 | 0.235 | 0.001 | HIGH |
| 32275 | 4.562 | 0.009 | 0.097 | 0.001 | HIGH |
| 32278 | 2.339 | 0.004 | 0.377 | 0.002 | HIGH |

5.5.79

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32272 | 3.113 | 0.006 | 0.114 | 0.001 | HIGH |
| 32280 | 0.340 | 0.001 | 0.007 | 0.000 | HIGH |
| 32281 | 0.397 | 0.001 | 0.010 | 0.000 | HIGH |
| 32282 | -0.063 | 0.000 | 0.021 | 0.000 | HIGH |
| 32283 | -0.736 | 0.001 | 0.029 | 0.000 | HIGH |
| 32286 | 2.342 | 0.004 | 0.217 | 0.001 | HIGH |
| 32287 | 1.973 | 0.004 | 0.045 | 0.000 | HIGH |
| 32288 | 1.454 | 0.003 | 0.030 | 0.000 | HIGH |
| 32289 | 0.581 | 0.001 | 0.014 | 0.000 | HIGH |
| 32290 | -0.875 | 0.002 | 0.016 | 0.000 | HIGH |
| 32293 | 1.413 | 0.003 | 1.158 | 0.007 | HIGH |
| 32294 | 1.663 | 0.003 | 0.166 | 0.001 | HIGH |
| 32295 | 0.071 | 0.000 | 0.011 | 0.000 | HIGH |
| 32296 | 0.347 | 0.001 | 0.016 | 0.000 | HIGH |
| 32297 | 0.250 | 0.000 | 0.072 | 0.000 | HIGH |
| 32300 | 1.168 | 0.002 | 1.384 | 0.009 | HIGH |
| 32301 | 1.320 | 0.002 | 0.045 | 0.000 | HIGH |
| 32302 | 1.176 | 0.002 | 0.008 | 0.000 | HIGH |
| 32303 | 0.871 | 0.002 | 0.041 | 0.000 | HIGH |
| 32304 | 0.625 | 0.001 | 0.052 | 0.000 | HIGH |
| 32308 | 1.888 | 0.004 | 0.471 | 0.003 | HIGH |
| 32309 | 1.752 | 0.003 | 0.056 | 0.000 | HIGH |
| 32310 | 1.434 | 0.003 | 0.041 | 0.000 | HIGH |
| 32311 | 1.161 | 0.002 | 0.103 | 0.001 | HIGH |
| 32312 | 0.510 | 0.001 | 0.041 | 0.000 | HIGH |
| 32316 | 1.891 | 0.004 | 0.240 | 0.002 | HIGH |
| 32317 | 1.707 | 0.003 | 0.059 | 0.000 | HIGH |
| 32318 | 1.495 | 0.003 | 0.055 | 0.000 | HIGH |
| 32319 | 1.176 | 0.002 | 0.053 | 0.000 | HIGH |
| 32320 | 0.631 | 0.001 | 0.021 | 0.000 | HIGH |
| 32323 | 1.741 | 0.003 | 0.111 | 0.001 | HIGH |
| 32324 | 1.788 | 0.003 | 0.083 | 0.001 | HIGH |
| 32325 | 1.527 | 0.003 | 0.058 | 0.000 | HIGH |
| 32326 | 1.226 | 0.002 | 0.043 | 0.000 | HIGH |
| 32327 | 0.734 | 0.001 | 0.002 | 0.000 | HIGH |
| 32329 | 2.262 | 0.004 | 0.282 | 0.002 | HIGH |
| 32330 | 1.941 | 0.004 | 0.108 | 0.001 | HIGH |
| 32331 | 1.534 | 0.003 | 0.028 | 0.000 | HIGH |
| 32332 | 1.359 | 0.003 | 0.030 | 0.000 | HIGH |
| 32333 | 1.004 | 0.002 | 0.112 | 0.001 | HIGH |
| 32334 | 2.018 | 0.004 | 0.267 | 0.002 | HIGH |
| 32335 | 1.821 | 0.003 | 0.103 | 0.001 | HIGH |
| 32336 | 0.775 | 0.001 | 0.026 | 0.000 | HIGH |
| 32337 | 1.668 | 0.003 | 0.089 | 0.001 | HIGH |
| 32338 | 1.303 | 0.002 | 0.203 | 0.001 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32339 | 1.120 | 0.002 | 0.058 | 0.000 | HIGH |
| 32340 | 1.035 | 0.002 | 0.103 | 0.001 | HIGH |
| 32341 | 0.672 | 0.001 | 0.109 | 0.001 | HIGH |
| 32342 | 0.736 | 0.001 | 0.101 | 0.001 | HIGH |
| 32343 | 0.343 | 0.001 | 0.047 | 0.000 | HIGH |
| 32346 | 0.178 | 0.000 | 0.028 | 0.000 | HIGH |
| 32347 | -0.244 | 0.000 | 0.021 | 0.000 | HIGH |
| 32348 | -0.347 | 0.001 | 0.098 | 0.001 | HIGH |
| 32349 | -0.493 | 0.001 | 0.017 | 0.000 | HIGH |
| 32350 | -0.694 | 0.001 | 0.003 | 0.000 | HIGH |
| 32351 | -0.659 | 0.001 | 0.008 | 0.000 | HIGH |
| 32353 | 0.331 | 0.001 | 0.004 | 0.000 | HIGH |
| 32354 | -0.031 | 0.000 | 0.001 | 0.000 | HIGH |
| 32355 | -0.517 | 0.001 | 0.032 | 0.000 | HIGH |
| 32356 | -0.698 | 0.001 | 0.025 | 0.000 | HIGH |
| 32357 | -0.830 | 0.002 | 0.035 | 0.000 | HIGH |
| 32358 | -1.039 | 0.002 | 0.035 | 0.000 | HIGH |
| 32361 | 0.026 | 0.000 | 0.007 | 0.000 | HIGH |
| 32362 | -0.285 | 0.001 | 0.032 | 0.000 | HIGH |
| 32363 | -0.593 | 0.001 | 0.043 | 0.000 | HIGH |
| 32364 | -1.005 | 0.002 | 0.079 | 0.001 | HIGH |
| 32365 | -1.203 | 0.002 | 0.082 | 0.001 | HIGH |
| 32368 | 0.011 | 0.000 | 0.015 | 0.000 | HIGH |
| 32369 | -0.191 | 0.000 | 0.021 | 0.000 | HIGH |
| 32370 | -0.515 | 0.001 | 0.019 | 0.000 | HIGH |
| 32371 | -0.779 | 0.001 | 0.116 | 0.001 | HIGH |
| 32372 | -1.064 | 0.002 | 0.175 | 0.001 | HIGH |
| 32375 | -0.171 | 0.000 | 0.018 | 0.000 | HIGH |
| 32376 | -0.411 | 0.001 | 0.004 | 0.000 | HIGH |
| 32377 | -0.688 | 0.001 | 0.017 | 0.000 | HIGH |
| 32378 | -0.899 | 0.002 | 0.060 | 0.000 | HIGH |
| 32379 | -0.815 | 0.002 | 0.405 | 0.003 | HIGH |
| 32383 | -0.510 | 0.001 | 0.036 | 0.000 | HIGH |
| 32384 | -0.763 | 0.001 | 0.018 | 0.000 | HIGH |
| 32385 | -1.065 | 0.002 | 0.016 | 0.000 | HIGH |
| 32386 | -1.380 | 0.003 | 0.025 | 0.000 | HIGH |
| 32387 | -1.542 | 0.003 | 0.146 | 0.001 | HIGH |
| 32390 | 0.803 | 0.002 | 0.024 | 0.000 | HIGH |
| 32391 | -0.529 | 0.001 | 0.022 | 0.000 | HIGH |
| 32392 | -1.881 | 0.004 | 0.055 | 0.000 | HIGH |
| 32393 | -1.818 | 0.003 | 0.127 | 0.001 | HIGH |
| 32394 | -1.915 | 0.004 | 0.146 | 0.001 | HIGH |
| 32396 | 3.977 | 0.008 | 0.063 | 0.000 | HIGH |
| 32397 | -2.267 | 0.004 | 0.016 | 0.000 | HIGH |
| 32398 | -3.576 | 0.007 | 0.036 | 0.000 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32399 | -1.904 | 0.004 | 0.122 | 0.001 | HIGH |
| 32400 | -1.906 | 0.004 | 0.365 | 0.002 | HIGH |
| 32401 | -2.699 | 0.005 | 0.594 | 0.004 | HIGH |
| 32402 | -7.724 | 0.015 | 0.576 | 0.004 | HIGH |
| 32403 | -4.840 | 0.009 | 0.032 | 0.000 | HIGH |
| 32404 | -4.832 | 0.009 | 0.113 | 0.001 | HIGH |
| 32405 | -1.754 | 0.003 | 3.883 | 0.025 | HIGH |
| 32406 | -11.167 | 0.021 | 1.602 | 0.010 | HIGH |
| 32407 | -6.900 | 0.013 | 0.524 | 0.003 | HIGH |
| 32408 | -4.219 | 0.008 | 0.118 | 0.001 | HIGH |
| 32409 | -4.905 | 0.009 | 1.070 | 0.007 | HIGH |
| 32410 | -8.987 | 0.017 | 2.161 | 0.014 | HIGH |
| 32411 | -6.395 | 0.012 | 0.247 | 0.002 | HIGH |
| 32412 | -6.096 | 0.012 | 0.251 | 0.002 | HIGH |
| 32413 | -2.792 | 0.005 | 0.592 | 0.004 | HIGH |
| 32414 | -3.541 | 0.007 | 0.326 | 0.002 | HIGH |
| 32415 | 0.085 | 0.000 | 0.842 | 0.005 | HIGH |
| 32425 | -2.838 | 0.005 | 0.051 | 0.000 | HIGH |
| 32426 | -1.661 | 0.003 | 0.018 | 0.000 | HIGH |
| 32427 | -4.701 | 0.009 | 0.023 | 0.000 | HIGH |
| 32443 | -2.881 | 0.005 | 0.023 | 0.000 | HIGH |
| 32444 | -1.432 | 0.003 | 0.305 | 0.002 | HIGH |
| 32445 | -4.913 | 0.009 | 0.305 | 0.002 | HIGH |
| 32446 | -1.819 | 0.003 | 0.450 | 0.003 | HIGH |
| 32447 | -1.813 | 0.003 | 1.151 | 0.007 | HIGH |
| 32463 | 1.758 | 0.003 | 0.048 | 0.000 | HIGH |
| 32464 | -7.299 | 0.014 | 0.059 | 0.000 | HIGH |
| 32465 | 0.642 | 0.001 | 0.069 | 0.000 | HIGH |
| 33301 | 3.509 | 0.007 | 0.073 | 0.000 | HIGH |
| 33302 | -3.623 | 0.007 | 0.081 | 0.001 | HIGH |
| 33303 | -2.877 | 0.005 | 0.071 | 0.000 | HIGH |
| 33304 | 4.488 | 0.008 | 0.010 | 0.000 | HIGH |
| 33305 | -0.097 | 0.000 | 0.051 | 0.000 | HIGH |
| 33306 | 0.609 | 0.001 | 0.044 | 0.000 | HIGH |
| 33307 | 0.639 | 0.001 | 0.115 | 0.001 | HIGH |
| 33308 | -0.413 | 0.001 | 0.067 | 0.000 | HIGH |
| 33313 | 3.468 | 0.007 | 0.024 | 0.000 | HIGH |
| 33314 | 3.829 | 0.007 | 0.017 | 0.000 | HIGH |
| 33319 | 0.407 | 0.001 | 0.038 | 0.000 | HIGH |
| 33320 | 0.822 | 0.002 | 0.248 | 0.002 | HIGH |
| 33321 | 4.441 | 0.008 | 0.049 | 0.000 | HIGH |
| 33322 | 3.970 | 0.007 | 0.039 | 0.000 | HIGH |
| 33323 | 2.393 | 0.005 | 0.067 | 0.000 | HIGH |
| 33324 | -0.268 | 0.001 | 0.127 | 0.001 | HIGH |
| 33327 | 1.718 | 0.003 | 0.108 | 0.001 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33328 | 0.176 | 0.000 | 0.085 | 0.001 | HIGH |
| 33329 | 0.638 | 0.001 | 0.070 | 0.000 | HIGH |
| 33330 | 1.189 | 0.002 | 0.281 | 0.002 | HIGH |
| 33331 | 3.737 | 0.007 | 0.095 | 0.001 | HIGH |
| 33332 | 3.287 | 0.006 | 0.058 | 0.000 | HIGH |
| 33333 | 3.088 | 0.006 | 0.105 | 0.001 | HIGH |
| 33334 | 1.610 | 0.003 | 0.285 | 0.002 | HIGH |
| 33338 | 1.398 | 0.003 | 0.271 | 0.002 | HIGH |
| 33339 | 0.778 | 0.001 | 0.135 | 0.001 | HIGH |
| 33340 | 1.056 | 0.002 | 0.116 | 0.001 | HIGH |
| 33341 | 1.321 | 0.002 | 0.200 | 0.001 | HIGH |
| 33342 | 3.003 | 0.006 | 0.114 | 0.001 | HIGH |
| 33343 | 2.344 | 0.004 | 0.044 | 0.000 | HIGH |
| 33344 | 2.157 | 0.004 | 0.149 | 0.001 | HIGH |
| 33345 | 2.026 | 0.004 | 0.334 | 0.002 | HIGH |
| 33350 | 1.124 | 0.002 | 0.371 | 0.002 | HIGH |
| 33351 | 1.060 | 0.002 | 0.142 | 0.001 | HIGH |
| 33352 | 1.220 | 0.002 | 0.108 | 0.001 | HIGH |
| 33353 | 1.601 | 0.003 | 0.090 | 0.001 | HIGH |
| 33354 | 2.266 | 0.004 | 0.107 | 0.001 | HIGH |
| 33355 | 1.562 | 0.003 | 0.057 | 0.000 | HIGH |
| 33356 | 1.414 | 0.003 | 0.114 | 0.001 | HIGH |
| 33357 | 0.854 | 0.002 | 0.254 | 0.002 | HIGH |
| 33363 | 0.823 | 0.002 | 0.250 | 0.002 | HIGH |
| 33364 | 0.979 | 0.002 | 0.077 | 0.000 | HIGH |
| 33365 | 1.422 | 0.003 | 0.060 | 0.000 | HIGH |
| 33366 | 2.484 | 0.005 | 0.047 | 0.000 | HIGH |
| 33367 | 1.487 | 0.003 | 0.069 | 0.000 | HIGH |
| 33368 | 0.853 | 0.002 | 0.055 | 0.000 | HIGH |
| 33369 | 0.783 | 0.001 | 0.054 | 0.000 | HIGH |
| 33370 | 0.662 | 0.001 | 0.164 | 0.001 | HIGH |
| 33371 | -0.311 | 0.001 | 0.187 | 0.001 | HIGH |
| 33376 | 0.157 | 0.000 | 0.129 | 0.001 | HIGH |
| 33377 | 0.335 | 0.001 | 0.116 | 0.001 | HIGH |
| 33378 | 0.804 | 0.002 | 0.026 | 0.000 | HIGH |
| 33379 | 1.522 | 0.003 | 0.030 | 0.000 | HIGH |
| 33380 | 3.157 | 0.006 | 0.059 | 0.000 | HIGH |
| 33381 | 0.474 | 0.001 | 0.032 | 0.000 | HIGH |
| 33382 | 0.135 | 0.000 | 0.028 | 0.000 | HIGH |
| 33383 | 0.055 | 0.000 | 0.030 | 0.000 | HIGH |
| 33384 | 0.018 | 0.000 | 0.051 | 0.000 | HIGH |
| 33385 | -0.012 | 0.000 | 0.113 | 0.001 | HIGH |
| 33386 | -0.337 | 0.001 | 0.243 | 0.002 | HIGH |
| 33390 | -0.430 | 0.001 | 0.129 | 0.001 | HIGH |
| 33391 | -0.411 | 0.001 | 0.059 | 0.000 | HIGH |

5.5.183

5.5.184

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33392 | -0.155 | 0.000 | 0.028 | 0.000 | HIGH |
| 33393 | 0.210 | 0.000 | 0.013 | 0.000 | HIGH |
| 33394 | 0.525 | 0.001 | 0.036 | 0.000 | HIGH |
| 33396 | 1.280 | 0.002 | 0.008 | 0.000 | HIGH |
| 33397 | 1.259 | 0.002 | 0.003 | 0.000 | HIGH |
| 33398 | 1.277 | 0.002 | 0.011 | 0.000 | HIGH |
| 33399 | 1.278 | 0.002 | 0.023 | 0.000 | HIGH |
| 33400 | 1.201 | 0.002 | 0.034 | 0.000 | HIGH |
| 33401 | 0.894 | 0.002 | 0.034 | 0.000 | HIGH |
| 33402 | 0.461 | 0.001 | 0.034 | 0.000 | HIGH |
| 33403 | -1.242 | 0.002 | 0.191 | 0.001 | HIGH |
| 33406 | 1.179 | 0.002 | 0.006 | 0.000 | HIGH |
| 33407 | 1.469 | 0.003 | 0.032 | 0.000 | HIGH |
| 33408 | 1.550 | 0.003 | 0.039 | 0.000 | HIGH |
| 33409 | 1.708 | 0.003 | 0.049 | 0.000 | HIGH |
| 33410 | 1.904 | 0.004 | 0.061 | 0.000 | HIGH |
| 33411 | 2.111 | 0.004 | 0.062 | 0.000 | HIGH |
| 33412 | 3.192 | 0.006 | 0.106 | 0.001 | HIGH |
| 33413 | 1.780 | 0.003 | 0.316 | 0.002 | HIGH |
| 33415 | 1.407 | 0.003 | 0.056 | 0.000 | HIGH |
| 33416 | 1.696 | 0.003 | 0.090 | 0.001 | HIGH |
| 33417 | 1.829 | 0.003 | 0.081 | 0.001 | HIGH |
| 33418 | 2.397 | 0.005 | 0.065 | 0.000 | HIGH |
| 33419 | 2.537 | 0.005 | 0.075 | 0.000 | HIGH |
| 33420 | 2.311 | 0.004 | 0.075 | 0.000 | HIGH |
| 33421 | 4.060 | 0.008 | 0.063 | 0.000 | HIGH |
| 33424 | 1.328 | 0.003 | 0.245 | 0.002 | HIGH |
| 33425 | 1.631 | 0.003 | 0.209 | 0.001 | HIGH |
| 33426 | 2.612 | 0.005 | 0.086 | 0.001 | HIGH |
| 33432 | -0.105 | 0.000 | 0.456 | 0.003 | HIGH |
| 33433 | 0.403 | 0.001 | 0.312 | 0.002 | HIGH |
| 33440 | -2.017 | 0.004 | 1.191 | 0.008 | HIGH |
| 33450 | -1.945 | 0.004 | 1.399 | 0.009 | HIGH |
| 33455 | 0.252 | 0.000 | 0.169 | 0.001 | HIGH |
| 33456 | 1.695 | 0.003 | 0.064 | 0.000 | HIGH |
| 33457 | 1.397 | 0.003 | 0.019 | 0.000 | HIGH |
| 33463 | 0.330 | 0.001 | 0.098 | 0.001 | HIGH |
| 33464 | 0.850 | 0.002 | 0.082 | 0.001 | HIGH |
| 33465 | 0.417 | 0.001 | 0.102 | 0.001 | HIGH |
| 33467 | 0.279 | 0.001 | 0.123 | 0.001 | HIGH |
| 33470 | 0.267 | 0.001 | 0.150 | 0.001 | HIGH |
| 33471 | 0.345 | 0.001 | 0.135 | 0.001 | HIGH |
| 33472 | 0.083 | 0.000 | 0.133 | 0.001 | HIGH |
| 33473 | -0.299 | 0.001 | 0.194 | 0.001 | HIGH |
| 33474 | 0.510 | 0.001 | 0.355 | 0.002 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33475 | 0.278 | 0.001 | 0.067 | 0.000 | HIGH |
| 33476 | 0.118 | 0.000 | 0.109 | 0.001 | HIGH |
| 33477 | -0.021 | 0.000 | 0.110 | 0.001 | HIGH |
| 33478 | -0.165 | 0.000 | 0.129 | 0.001 | HIGH |
| 33479 | -0.271 | 0.001 | 0.377 | 0.002 | HIGH |
| 33480 | 0.661 | 0.001 | 0.297 | 0.002 | HIGH |
| 33481 | 0.476 | 0.001 | 0.127 | 0.001 | HIGH |
| 33482 | 0.028 | 0.000 | 0.113 | 0.001 | HIGH |
| 33483 | -0.396 | 0.001 | 0.093 | 0.001 | HIGH |
| 33484 | -0.551 | 0.001 | 0.382 | 0.002 | HIGH |
| 33485 | 0.706 | 0.001 | 0.169 | 0.001 | HIGH |
| 33486 | 0.487 | 0.001 | 0.143 | 0.001 | HIGH |
| 33487 | -0.209 | 0.000 | 0.104 | 0.001 | HIGH |
| 33488 | -0.915 | 0.002 | 0.289 | 0.002 | HIGH |
| 33489 | 1.041 | 0.002 | 0.162 | 0.001 | HIGH |
| 33490 | 0.945 | 0.002 | 0.136 | 0.001 | HIGH |
| 33491 | -0.330 | 0.001 | 0.188 | 0.001 | HIGH |
| 33492 | 3.427 | 0.006 | 0.143 | 0.001 | HIGH |
| 33499 | 0.877 | 0.002 | 0.081 | 0.001 | HIGH |
| 33500 | 0.280 | 0.001 | 0.027 | 0.000 | HIGH |
| 33501 | -0.233 | 0.000 | 0.040 | 0.000 | HIGH |
| 33502 | -0.490 | 0.001 | 0.030 | 0.000 | HIGH |
| 33503 | -0.794 | 0.001 | 0.010 | 0.000 | HIGH |
| 33504 | -1.713 | 0.003 | 0.026 | 0.000 | HIGH |
| 33505 | -3.448 | 0.007 | 0.225 | 0.001 | HIGH |
| 33509 | 0.378 | 0.001 | 0.021 | 0.000 | HIGH |
| 33510 | -0.093 | 0.000 | 0.012 | 0.000 | HIGH |
| 33511 | -0.360 | 0.001 | 0.010 | 0.000 | HIGH |
| 33512 | -0.509 | 0.001 | 0.003 | 0.000 | HIGH |
| 33513 | -0.939 | 0.002 | 0.034 | 0.000 | HIGH |
| 33514 | -1.643 | 0.003 | 0.086 | 0.001 | HIGH |
| 33515 | -1.781 | 0.003 | 0.099 | 0.001 | HIGH |
| 33518 | -1.724 | 0.003 | 0.054 | 0.000 | HIGH |
| 33519 | -0.805 | 0.002 | 0.036 | 0.000 | HIGH |
| 33520 | -0.340 | 0.001 | 0.052 | 0.000 | HIGH |
| 33521 | -0.267 | 0.001 | 0.036 | 0.000 | HIGH |
| 33522 | -0.411 | 0.001 | 0.045 | 0.000 | HIGH |
| 33523 | -0.865 | 0.002 | 0.077 | 0.000 | HIGH |
| 33524 | -1.110 | 0.002 | 0.087 | 0.001 | HIGH |
| 33530 | 0.044 | 0.000 | 0.074 | 0.000 | HIGH |
| 33531 | -0.120 | 0.000 | 0.129 | 0.001 | HIGH |
| 33532 | -0.292 | 0.001 | 0.147 | 0.001 | HIGH |
| 33539 | 0.675 | 0.001 | 0.199 | 0.001 | HIGH |
| 33540 | 0.569 | 0.001 | 0.244 | 0.002 | HIGH |
| 33550 | 1.609 | 0.003 | 0.602 | 0.004 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33553 | -2.794 | 0.005 | 0.149 | 0.001 | HIGH |
| 33554 | -0.874 | 0.002 | 0.246 | 0.002 | HIGH |
| 33559 | 0.792 | 0.001 | 0.950 | 0.006 | HIGH |
| 33561 | -4.960 | 0.009 | 0.112 | 0.001 | HIGH |
| 33562 | -3.801 | 0.007 | 0.121 | 0.001 | HIGH |
| 33563 | -3.488 | 0.007 | 0.128 | 0.001 | HIGH |
| 33568 | -3.786 | 0.007 | 0.085 | 0.001 | HIGH |
| 33569 | -4.138 | 0.008 | 0.078 | 0.000 | HIGH |
| 33570 | -3.926 | 0.007 | 0.142 | 0.001 | HIGH |
| 33571 | -3.778 | 0.007 | 0.152 | 0.001 | HIGH |
| 33574 | 0.168 | 0.000 | 0.382 | 0.002 | HIGH |
| 33575 | -3.204 | 0.006 | 0.105 | 0.001 | HIGH |
| 33576 | -3.429 | 0.006 | 0.044 | 0.000 | HIGH |
| 33577 | -3.227 | 0.006 | 0.102 | 0.001 | HIGH |
| 33578 | -2.653 | 0.005 | 0.103 | 0.001 | HIGH |
| 33579 | -1.668 | 0.003 | 0.123 | 0.001 | HIGH |
| 33580 | -1.170 | 0.002 | 0.732 | 0.005 | HIGH |
| 33581 | -2.972 | 0.006 | 0.124 | 0.001 | HIGH |
| 33582 | -2.917 | 0.006 | 0.054 | 0.000 | HIGH |
| 33583 | -2.752 | 0.005 | 0.105 | 0.001 | HIGH |
| 33584 | -2.614 | 0.005 | 0.176 | 0.001 | HIGH |
| 33585 | -2.355 | 0.004 | 0.621 | 0.004 | HIGH |
| 33586 | -2.643 | 0.005 | 0.134 | 0.001 | HIGH |
| 33587 | -2.445 | 0.005 | 0.082 | 0.001 | HIGH |
| 33588 | -2.357 | 0.004 | 0.166 | 0.001 | HIGH |
| 33589 | -2.094 | 0.004 | 0.291 | 0.002 | HIGH |
| 33590 | -2.229 | 0.004 | 0.131 | 0.001 | HIGH |
| 33591 | -1.984 | 0.004 | 0.125 | 0.001 | HIGH |
| 33592 | -1.712 | 0.003 | 0.179 | 0.001 | HIGH |
| 33593 | -1.767 | 0.003 | 0.098 | 0.001 | HIGH |
| 33594 | -1.497 | 0.003 | 0.163 | 0.001 | HIGH |
| 33595 | -1.155 | 0.002 | 0.062 | 0.000 | HIGH |
| 42201 | -1.438 | 0.003 | 0.097 | 0.001 | HIGH |
| 42202 | 4.183 | 0.008 | 0.048 | 0.000 | HIGH |
| 42203 | 5.411 | 0.010 | 0.064 | 0.000 | HIGH |
| 42204 | -5.150 | 0.010 | 0.143 | 0.001 | HIGH |
| 42205 | 1.984 | 0.004 | 2.159 | 0.014 | HIGH |
| 42206 | -4.698 | 0.009 | 2.359 | 0.015 | HIGH |
| 42207 | -2.714 | 0.005 | 0.690 | 0.004 | HIGH |
| 42208 | -3.025 | 0.006 | 2.822 | 0.018 | HIGH |
| 42215 | -0.688 | 0.001 | 0.086 | 0.001 | HIGH |
| 42216 | -2.100 | 0.004 | 0.071 | 0.000 | HIGH |
| 42222 | -1.669 | 0.003 | 2.177 | 0.014 | HIGH |
| 42223 | -3.604 | 0.007 | 1.579 | 0.010 | HIGH |
| 42224 | -0.047 | 0.000 | 0.050 | 0.000 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42225 | -0.690 | 0.001 | 0.025 | 0.000 | HIGH |
| 42226 | 0.918 | 0.002 | 0.281 | 0.002 | HIGH |
| 42227 | 2.466 | 0.005 | 0.271 | 0.002 | HIGH |
| 42228 | 5.236 | 0.010 | 2.391 | 0.015 | HIGH |
| 42229 | -6.774 | 0.013 | 2.690 | 0.017 | HIGH |
| 42230 | -4.030 | 0.008 | 3.612 | 0.023 | HIGH |
| 42231 | -2.887 | 0.005 | 3.941 | 0.025 | HIGH |
| 42232 | -3.642 | 0.007 | 3.870 | 0.025 | HIGH |
| 42233 | -4.597 | 0.009 | 4.082 | 0.026 | HIGH |
| 42234 | 1.427 | 0.003 | 0.179 | 0.001 | HIGH |
| 42235 | 0.819 | 0.002 | 0.154 | 0.001 | HIGH |
| 42236 | 1.649 | 0.003 | 0.241 | 0.002 | HIGH |
| 42237 | 3.708 | 0.007 | 0.369 | 0.002 | HIGH |
| 42238 | 5.254 | 0.010 | 0.516 | 0.003 | HIGH |
| 42239 | 2.710 | 0.005 | 5.299 | 0.034 | HIGH |
| 42240 | -5.993 | 0.011 | 12.848 | 0.082 | HIGH |
| 42241 | -5.706 | 0.011 | 14.931 | 0.095 | HIGH |
| 42242 | -5.432 | 0.010 | 10.462 | 0.067 | HIGH |
| 42243 | -5.176 | 0.010 | 2.479 | 0.016 | HIGH |
| 42244 | -5.088 | 0.010 | 4.114 | 0.026 | HIGH |
| 42245 | 0.809 | 0.002 | 0.242 | 0.002 | HIGH |
| 42246 | 3.217 | 0.006 | 0.600 | 0.004 | HIGH |
| 42247 | 1.100 | 0.002 | 0.554 | 0.004 | HIGH |
| 42248 | 3.598 | 0.007 | 0.029 | 0.000 | HIGH |
| 42249 | 7.520 | 0.014 | 0.692 | 0.004 | HIGH |
| 42250 | 13.426 | 0.025 | 1.866 | 0.012 | HIGH |
| 42251 | -9.597 | 0.018 | 44.634 | 0.285 | 6.73 |
| 42252 | -1.482 | 0.003 | 0.115 | 0.001 | HIGH |
| 42253 | -11.470 | 0.022 | 40.546 | 0.259 | 7.65 |
| 42254 | -7.013 | 0.013 | 2.949 | 0.019 | HIGH |
| 42255 | -5.289 | 0.010 | 2.966 | 0.019 | HIGH |
| 42256 | -4.539 | 0.009 | 2.818 | 0.018 | HIGH |
| 42257 | 0.643 | 0.001 | 0.048 | 0.000 | HIGH |
| 42258 | 0.956 | 0.002 | 0.197 | 0.001 | HIGH |
| 42259 | 3.050 | 0.006 | 0.166 | 0.001 | HIGH |
| 42260 | 0.950 | 0.002 | 0.185 | 0.001 | HIGH |
| 42261 | 3.164 | 0.006 | 0.236 | 0.002 | HIGH |
| 42262 | 5.482 | 0.010 | 4.102 | 0.026 | HIGH |
| 42263 | 19.180 | 0.036 | 3.490 | 0.022 | HIGH |
| 42264 | -3.659 | 0.007 | 23.035 | 0.147 | HIGH |
| 42265 | -5.045 | 0.010 | 19.861 | 0.127 | HIGH |
| 42266 | -4.779 | 0.009 | 6.962 | 0.044 | HIGH |
| 42267 | -3.982 | 0.008 | 1.664 | 0.011 | HIGH |
| 42268 | -3.387 | 0.006 | 1.643 | 0.010 | HIGH |
| 42269 | -2.823 | 0.005 | 1.198 | 0.008 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42270 | -0.458 | 0.001 | 0.037 | 0.000 | HIGH |
| 42271 | -0.781 | 0.001 | 0.087 | 0.001 | HIGH |
| 42272 | -1.886 | 0.004 | 0.217 | 0.001 | HIGH |
| 42273 | -1.423 | 0.003 | 0.067 | 0.000 | HIGH |
| 42274 | -1.224 | 0.002 | 0.029 | 0.000 | HIGH |
| 42275 | 2.949 | 0.006 | 0.108 | 0.001 | HIGH |
| 42278 | -1.037 | 0.002 | 0.173 | 0.001 | HIGH |
| 42279 | -2.194 | 0.004 | 0.275 | 0.002 | HIGH |
| 42280 | -2.210 | 0.004 | 0.125 | 0.001 | HIGH |
| 42281 | -3.042 | 0.006 | 0.050 | 0.000 | HIGH |
| 42282 | -4.404 | 0.008 | 0.044 | 0.000 | HIGH |
| 42283 | 1.025 | 0.002 | 0.104 | 0.001 | HIGH |
| 42286 | -0.739 | 0.001 | 0.166 | 0.001 | HIGH |
| 42287 | -1.234 | 0.002 | 0.243 | 0.002 | HIGH |
| 42288 | -3.709 | 0.007 | 0.198 | 0.001 | HIGH |
| 42289 | -5.767 | 0.011 | 0.258 | 0.002 | HIGH |
| 42290 | -7.521 | 0.014 | 0.333 | 0.002 | HIGH |
| 42293 | 0.150 | 0.000 | 0.482 | 0.003 | HIGH |
| 42294 | -2.073 | 0.004 | 0.610 | 0.004 | HIGH |
| 42295 | -5.959 | 0.011 | 0.595 | 0.004 | HIGH |
| 42296 | -7.514 | 0.014 | 0.803 | 0.005 | HIGH |
| 42297 | -10.539 | 0.020 | 1.102 | 0.007 | HIGH |
| 42300 | -0.044 | 0.000 | 1.117 | 0.007 | HIGH |
| 42301 | -2.316 | 0.004 | 1.276 | 0.008 | HIGH |
| 42302 | -8.155 | 0.015 | 1.367 | 0.009 | HIGH |
| 42303 | -5.650 | 0.011 | 1.269 | 0.008 | HIGH |
| 42304 | -9.329 | 0.018 | 1.436 | 0.009 | HIGH |
| 42308 | -0.535 | 0.001 | 4.963 | 0.032 | HIGH |
| 42309 | 0.432 | 0.001 | 0.333 | 0.002 | HIGH |
| 42310 | -8.842 | 0.017 | 4.475 | 0.029 | HIGH |
| 42311 | -8.495 | 0.016 | 4.526 | 0.029 | HIGH |
| 42312 | -10.366 | 0.020 | 4.403 | 0.028 | HIGH |
| 42316 | 1.495 | 0.003 | 2.514 | 0.016 | HIGH |
| 42317 | 1.526 | 0.003 | 27.655 | 0.177 | HIGH |
| 42318 | -7.215 | 0.014 | 12.410 | 0.079 | HIGH |
| 42319 | -7.495 | 0.014 | 10.213 | 0.065 | HIGH |
| 42320 | -8.823 | 0.017 | 3.830 | 0.024 | HIGH |
| 42323 | 6.377 | 0.012 | 24.317 | 0.155 | HIGH |
| 42324 | 0.587 | 0.001 | 0.173 | 0.001 | HIGH |
| 42325 | -5.911 | 0.011 | 33.715 | 0.215 | HIGH |
| 42326 | -6.138 | 0.012 | 3.734 | 0.024 | HIGH |
| 42327 | -5.343 | 0.010 | 4.640 | 0.030 | HIGH |
| 42329 | 1.445 | 0.003 | 18.615 | 0.119 | HIGH |
| 42330 | 1.092 | 0.002 | 14.863 | 0.095 | HIGH |
| 42331 | -3.311 | 0.006 | 10.208 | 0.065 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42332 | -3.532 | 0.007 | 3.365 | 0.021 | HIGH |
| 42333 | -2.556 | 0.005 | 3.690 | 0.024 | HIGH |
| 42334 | 0.921 | 0.002 | 12.863 | 0.082 | HIGH |
| 42335 | 0.060 | 0.000 | 5.744 | 0.037 | HIGH |
| 42336 | -1.638 | 0.003 | 4.930 | 0.031 | HIGH |
| 42337 | -1.720 | 0.003 | 4.447 | 0.028 | HIGH |
| 42338 | 0.872 | 0.002 | 4.626 | 0.030 | HIGH |
| 42339 | 0.200 | 0.000 | 3.076 | 0.020 | HIGH |
| 42340 | -0.536 | 0.001 | 2.197 | 0.014 | HIGH |
| 42341 | 1.030 | 0.002 | 1.155 | 0.007 | HIGH |
| 42342 | 0.415 | 0.001 | 1.179 | 0.008 | HIGH |
| 42343 | 0.362 | 0.001 | 0.234 | 0.001 | HIGH |
| 42346 | -2.046 | 0.004 | 4.057 | 0.026 | HIGH |
| 42347 | 0.465 | 0.001 | 2.528 | 0.016 | HIGH |
| 42348 | 1.264 | 0.002 | 2.551 | 0.016 | HIGH |
| 42349 | 1.063 | 0.002 | 2.196 | 0.014 | HIGH |
| 42350 | 0.268 | 0.001 | 1.387 | 0.009 | HIGH |
| 42351 | -0.283 | 0.001 | 1.474 | 0.009 | HIGH |
| 42353 | -2.986 | 0.006 | 9.992 | 0.064 | HIGH |
| 42354 | 1.527 | 0.003 | 3.540 | 0.023 | HIGH |
| 42355 | 2.193 | 0.004 | 7.481 | 0.048 | HIGH |
| 42356 | 1.928 | 0.004 | 7.563 | 0.048 | HIGH |
| 42357 | 0.231 | 0.000 | 3.555 | 0.023 | HIGH |
| 42358 | -0.293 | 0.001 | 3.825 | 0.024 | HIGH |
| 42361 | 5.443 | 0.010 | 7.350 | 0.047 | HIGH |
| 42362 | 4.151 | 0.008 | 5.768 | 0.037 | HIGH |
| 42363 | 3.838 | 0.007 | 13.670 | 0.087 | HIGH |
| 42364 | -0.565 | 0.001 | 9.010 | 0.058 | HIGH |
| 42365 | -1.307 | 0.002 | 8.094 | 0.052 | HIGH |
| 42368 | 11.041 | 0.021 | 4.785 | 0.031 | HIGH |
| 42369 | 8.094 | 0.015 | 4.638 | 0.030 | HIGH |
| 42370 | 7.822 | 0.015 | 13.026 | 0.083 | HIGH |
| 42371 | -3.422 | 0.006 | 23.536 | 0.150 | HIGH |
| 42372 | -3.555 | 0.007 | 17.423 | 0.111 | HIGH |
| 42375 | 13.376 | 0.025 | 1.749 | 0.011 | HIGH |
| 42376 | 4.847 | 0.009 | 3.277 | 0.021 | HIGH |
| 42377 | 5.176 | 0.010 | 11.857 | 0.076 | HIGH |
| 42378 | -0.875 | 0.002 | 0.129 | 0.001 | HIGH |
| 42379 | -2.575 | 0.005 | 18.638 | 0.119 | HIGH |
| 42383 | 10.027 | 0.019 | 0.839 | 0.005 | HIGH |
| 42384 | 8.185 | 0.015 | 0.540 | 0.003 | HIGH |
| 42385 | 10.748 | 0.020 | 1.281 | 0.008 | HIGH |
| 42386 | -2.402 | 0.005 | 6.565 | 0.042 | HIGH |
| 42387 | -2.019 | 0.004 | 7.454 | 0.048 | HIGH |
| 42390 | 8.987 | 0.017 | 0.232 | 0.001 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42391 | 7.277 | 0.014 | 0.371 | 0.002 | HIGH |
| 42392 | 5.774 | 0.011 | 0.517 | 0.003 | HIGH |
| 42393 | -0.053 | 0.000 | 1.167 | 0.007 | HIGH |
| 42394 | 1.342 | 0.003 | 2.264 | 0.014 | HIGH |
| 42396 | 6.181 | 0.012 | 0.134 | 0.001 | HIGH |
| 42397 | 6.298 | 0.012 | 0.207 | 0.001 | HIGH |
| 42398 | 4.276 | 0.008 | 0.124 | 0.001 | HIGH |
| 42399 | 0.395 | 0.001 | 0.427 | 0.003 | HIGH |
| 42400 | -2.101 | 0.004 | 1.511 | 0.010 | HIGH |
| 42401 | 3.856 | 0.007 | 0.086 | 0.001 | HIGH |
| 42402 | 4.480 | 0.008 | 0.082 | 0.001 | HIGH |
| 42403 | 3.675 | 0.007 | 0.229 | 0.001 | HIGH |
| 42404 | 1.203 | 0.002 | 0.187 | 0.001 | HIGH |
| 42405 | -1.133 | 0.002 | 0.568 | 0.004 | HIGH |
| 42406 | 3.269 | 0.006 | 0.030 | 0.000 | HIGH |
| 42407 | 3.828 | 0.007 | 0.281 | 0.002 | HIGH |
| 42408 | 2.073 | 0.004 | 0.695 | 0.004 | HIGH |
| 42409 | -0.939 | 0.002 | 0.530 | 0.003 | HIGH |
| 42410 | 1.257 | 0.002 | 0.145 | 0.001 | HIGH |
| 42411 | 1.396 | 0.003 | 0.358 | 0.002 | HIGH |
| 42412 | 2.266 | 0.004 | 0.178 | 0.001 | HIGH |
| 42413 | 0.475 | 0.001 | 0.090 | 0.001 | HIGH |
| 42414 | 0.106 | 0.000 | 0.043 | 0.000 | HIGH |
| 42415 | -0.068 | 0.000 | 0.106 | 0.001 | HIGH |
| 42455 | -14.102 | 0.027 | 6.005 | 0.038 | HIGH |
| 42456 | -22.136 | 0.042 | 4.255 | 0.027 | HIGH |
| 43301 | -1.334 | 0.003 | 0.112 | 0.001 | HIGH |
| 43302 | 2.371 | 0.004 | 0.288 | 0.002 | HIGH |
| 43303 | 2.424 | 0.005 | 0.469 | 0.003 | HIGH |
| 43304 | -2.814 | 0.005 | 0.188 | 0.001 | HIGH |
| 43305 | -0.683 | 0.001 | 0.213 | 0.001 | HIGH |
| 43306 | -0.897 | 0.002 | 0.458 | 0.003 | HIGH |
| 43307 | -1.447 | 0.003 | 0.192 | 0.001 | HIGH |
| 43308 | -0.183 | 0.000 | 0.265 | 0.002 | HIGH |
| 43313 | -1.729 | 0.003 | 0.128 | 0.001 | HIGH |
| 43314 | -2.150 | 0.004 | 0.210 | 0.001 | HIGH |
| 43319 | -0.953 | 0.002 | 0.225 | 0.001 | HIGH |
| 43320 | -0.965 | 0.002 | 0.129 | 0.001 | HIGH |
| 43321 | -2.592 | 0.005 | 0.211 | 0.001 | HIGH |
| 43322 | -2.520 | 0.005 | 0.086 | 0.001 | HIGH |
| 43323 | -2.175 | 0.004 | 0.201 | 0.001 | HIGH |
| 43324 | -2.664 | 0.005 | 2.611 | 0.017 | HIGH |
| 43327 | 0.948 | 0.002 | 2.626 | 0.017 | HIGH |
| 43328 | 0.227 | 0.000 | 0.210 | 0.001 | HIGH |
| 43329 | -0.628 | 0.001 | 0.088 | 0.001 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43330 | -0.856 | 0.002 | 0.221 | 0.001 | HIGH |
| 43331 | -2.577 | 0.005 | 0.240 | 0.002 | HIGH |
| 43332 | -2.036 | 0.004 | 0.176 | 0.001 | HIGH |
| 43333 | -1.699 | 0.003 | 0.218 | 0.001 | HIGH |
| 43334 | -0.869 | 0.002 | 2.123 | 0.014 | HIGH |
| 43338 | -0.182 | 0.000 | 2.121 | 0.014 | HIGH |
| 43339 | -0.250 | 0.000 | 0.217 | 0.001 | HIGH |
| 43340 | -0.569 | 0.001 | 0.191 | 0.001 | HIGH |
| 43341 | -0.377 | 0.001 | 0.221 | 0.001 | HIGH |
| 43342 | -2.758 | 0.005 | 0.202 | 0.001 | HIGH |
| 43343 | -2.084 | 0.004 | 0.219 | 0.001 | HIGH |
| 43344 | -2.063 | 0.004 | 0.142 | 0.001 | HIGH |
| 43345 | -2.081 | 0.004 | 0.763 | 0.005 | HIGH |
| 43346 | 1.296 | 0.002 | 0.920 | 0.006 | HIGH |
| 43349 | -0.892 | 0.002 | 0.929 | 0.006 | HIGH |
| 43350 | 0.361 | 0.001 | 0.753 | 0.005 | HIGH |
| 43351 | 0.060 | 0.000 | 0.160 | 0.001 | HIGH |
| 43352 | -0.105 | 0.000 | 0.219 | 0.001 | HIGH |
| 43353 | 0.199 | 0.000 | 0.209 | 0.001 | HIGH |
| 43354 | -3.487 | 0.007 | 0.186 | 0.001 | HIGH |
| 43355 | -2.322 | 0.004 | 0.185 | 0.001 | HIGH |
| 43356 | -2.001 | 0.004 | 0.143 | 0.001 | HIGH |
| 43357 | -1.761 | 0.003 | 0.276 | 0.002 | HIGH |
| 43358 | -1.260 | 0.002 | 0.755 | 0.005 | HIGH |
| 43359 | -1.281 | 0.002 | 0.826 | 0.005 | HIGH |
| 43360 | -0.070 | 0.000 | 0.289 | 0.002 | HIGH |
| 43361 | 1.382 | 0.003 | 0.845 | 0.005 | HIGH |
| 43362 | 0.351 | 0.001 | 0.747 | 0.005 | HIGH |
| 43363 | 0.372 | 0.001 | 0.256 | 0.002 | HIGH |
| 43364 | 0.348 | 0.001 | 0.159 | 0.001 | HIGH |
| 43365 | 0.499 | 0.001 | 0.164 | 0.001 | HIGH |
| 43366 | 1.187 | 0.002 | 0.169 | 0.001 | HIGH |
| 43367 | -3.997 | 0.008 | 0.122 | 0.001 | HIGH |
| 43368 | -2.659 | 0.005 | 0.125 | 0.001 | HIGH |
| 43369 | -1.905 | 0.004 | 0.092 | 0.001 | HIGH |
| 43370 | -1.349 | 0.003 | 0.071 | 0.000 | HIGH |
| 43371 | -0.841 | 0.002 | 0.276 | 0.002 | HIGH |
| 43372 | -0.655 | 0.001 | 0.343 | 0.002 | HIGH |
| 43373 | -0.327 | 0.001 | 0.311 | 0.002 | HIGH |
| 43374 | 0.424 | 0.001 | 0.323 | 0.002 | HIGH |
| 43375 | 0.412 | 0.001 | 0.348 | 0.002 | HIGH |
| 43376 | 0.238 | 0.000 | 0.258 | 0.002 | HIGH |
| 43377 | 0.407 | 0.001 | 0.075 | 0.000 | HIGH |
| 43378 | 0.725 | 0.001 | 0.104 | 0.001 | HIGH |
| 43379 | 1.180 | 0.002 | 0.101 | 0.001 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43380 | 2.072 | 0.004 | 0.075 | 0.000 | HIGH |
| 43382 | -2.276 | 0.004 | 0.167 | 0.001 | HIGH |
| 43383 | -1.428 | 0.003 | 0.027 | 0.000 | HIGH |
| 43384 | -0.807 | 0.002 | 0.031 | 0.000 | HIGH |
| 43385 | -0.413 | 0.001 | 0.051 | 0.000 | HIGH |
| 43386 | -0.239 | 0.000 | 0.090 | 0.001 | HIGH |
| 43387 | -0.112 | 0.000 | 0.104 | 0.001 | HIGH |
| 43388 | 0.131 | 0.000 | 0.077 | 0.000 | HIGH |
| 43389 | 0.258 | 0.000 | 0.103 | 0.001 | HIGH |
| 43390 | 0.193 | 0.000 | 0.082 | 0.001 | HIGH |
| 43391 | 0.221 | 0.000 | 0.042 | 0.000 | HIGH |
| 43392 | 0.558 | 0.001 | 0.045 | 0.000 | HIGH |
| 43393 | 1.095 | 0.002 | 0.038 | 0.000 | HIGH |
| 43394 | 1.780 | 0.003 | 0.042 | 0.000 | HIGH |
| 43397 | 0.654 | 0.001 | 0.231 | 0.001 | HIGH |
| 43398 | -0.378 | 0.001 | 0.072 | 0.000 | HIGH |
| 43399 | -0.823 | 0.002 | 0.025 | 0.000 | HIGH |
| 43400 | -0.736 | 0.001 | 0.128 | 0.001 | HIGH |
| 43401 | -0.498 | 0.001 | 0.209 | 0.001 | HIGH |
| 43402 | 0.197 | 0.000 | 0.208 | 0.001 | HIGH |
| 43403 | 1.905 | 0.004 | 0.374 | 0.002 | HIGH |
| 43406 | 0.677 | 0.001 | 0.230 | 0.001 | HIGH |
| 43407 | -0.149 | 0.000 | 0.193 | 0.001 | HIGH |
| 43408 | -0.888 | 0.002 | 0.153 | 0.001 | HIGH |
| 43409 | -1.195 | 0.002 | 0.130 | 0.001 | HIGH |
| 43410 | -1.206 | 0.002 | 0.363 | 0.002 | HIGH |
| 43411 | -1.531 | 0.003 | 0.435 | 0.003 | HIGH |
| 43412 | -1.499 | 0.003 | 0.475 | 0.003 | HIGH |
| 43413 | 0.167 | 0.000 | 1.289 | 0.008 | HIGH |
| 43415 | -0.309 | 0.001 | 0.302 | 0.002 | HIGH |
| 43416 | -1.014 | 0.002 | 0.290 | 0.002 | HIGH |
| 43417 | -1.555 | 0.003 | 0.203 | 0.001 | HIGH |
| 43418 | -1.783 | 0.003 | 0.286 | 0.002 | HIGH |
| 43419 | -1.753 | 0.003 | 0.630 | 0.004 | HIGH |
| 43420 | -2.704 | 0.005 | 0.740 | 0.005 | HIGH |
| 43421 | -2.550 | 0.005 | 1.323 | 0.008 | HIGH |
| 43424 | -1.406 | 0.003 | 0.398 | 0.003 | HIGH |
| 43425 | -1.971 | 0.004 | 0.384 | 0.002 | HIGH |
| 43426 | -2.464 | 0.005 | 0.182 | 0.001 | HIGH |
| 43427 | -2.950 | 0.006 | 0.505 | 0.003 | HIGH |
| 43428 | -5.297 | 0.010 | 1.593 | 0.010 | HIGH |
| 43430 | -2.262 | 0.004 | 2.547 | 0.016 | HIGH |
| 43432 | -2.147 | 0.004 | 0.607 | 0.004 | HIGH |
| 43433 | -2.557 | 0.005 | 0.367 | 0.002 | HIGH |
| 43434 | -2.728 | 0.005 | 0.442 | 0.003 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43435 | -2.388 | 0.005 | 2.011 | 0.013 | HIGH |
| 43438 | -3.807 | 0.007 | 2.453 | 0.016 | HIGH |
| 43440 | -2.476 | 0.005 | 0.695 | 0.004 | HIGH |
| 43441 | -2.873 | 0.005 | 0.313 | 0.002 | HIGH |
| 43442 | -3.185 | 0.006 | 0.583 | 0.004 | HIGH |
| 43443 | -3.726 | 0.007 | 0.585 | 0.004 | HIGH |
| 43446 | -1.975 | 0.004 | 3.890 | 0.025 | HIGH |
| 43450 | -2.490 | 0.005 | 0.481 | 0.003 | HIGH |
| 43451 | -3.006 | 0.006 | 0.501 | 0.003 | HIGH |
| 43452 | -3.738 | 0.007 | 0.504 | 0.003 | HIGH |
| 43453 | -2.898 | 0.005 | 0.471 | 0.003 | HIGH |
| 43455 | -3.243 | 0.006 | 1.529 | 0.010 | HIGH |
| 43456 | -2.471 | 0.005 | 0.878 | 0.006 | HIGH |
| 43457 | -2.875 | 0.005 | 1.119 | 0.007 | HIGH |
| 43459 | -2.194 | 0.004 | 0.452 | 0.003 | HIGH |
| 43460 | -2.580 | 0.005 | 0.441 | 0.003 | HIGH |
| 43461 | -2.592 | 0.005 | 0.432 | 0.003 | HIGH |
| 43462 | -1.483 | 0.003 | 0.459 | 0.003 | HIGH |
| 43463 | -2.055 | 0.004 | 0.790 | 0.005 | HIGH |
| 43464 | -1.993 | 0.004 | 0.583 | 0.004 | HIGH |
| 43465 | -1.210 | 0.002 | 0.488 | 0.003 | HIGH |
| 43467 | -1.610 | 0.003 | 0.469 | 0.003 | HIGH |
| 43468 | -1.763 | 0.003 | 0.449 | 0.003 | HIGH |
| 43469 | -1.535 | 0.003 | 0.374 | 0.002 | HIGH |
| 43470 | -1.539 | 0.003 | 0.531 | 0.003 | HIGH |
| 43471 | -1.224 | 0.002 | 0.515 | 0.003 | HIGH |
| 43472 | -0.892 | 0.002 | 0.229 | 0.001 | HIGH |
| 43473 | -0.712 | 0.001 | 0.326 | 0.002 | HIGH |
| 43474 | -0.702 | 0.001 | 0.745 | 0.005 | HIGH |
| 43475 | -0.861 | 0.002 | 0.323 | 0.002 | HIGH |
| 43476 | -1.012 | 0.002 | 0.316 | 0.002 | HIGH |
| 43477 | -0.971 | 0.002 | 0.317 | 0.002 | HIGH |
| 43478 | -0.791 | 0.001 | 0.267 | 0.002 | HIGH |
| 43479 | -0.893 | 0.002 | 0.338 | 0.002 | HIGH |
| 43480 | 0.076 | 0.000 | 0.750 | 0.005 | HIGH |
| 43481 | -0.276 | 0.001 | 0.216 | 0.001 | HIGH |
| 43482 | -0.574 | 0.001 | 0.200 | 0.001 | HIGH |
| 43483 | -0.707 | 0.001 | 0.199 | 0.001 | HIGH |
| 43484 | -0.871 | 0.002 | 0.172 | 0.001 | HIGH |
| 43485 | 0.477 | 0.001 | 0.558 | 0.004 | HIGH |
| 43486 | 0.031 | 0.000 | 0.159 | 0.001 | HIGH |
| 43487 | -0.403 | 0.001 | 0.098 | 0.001 | HIGH |
| 43488 | -0.860 | 0.002 | 0.077 | 0.000 | HIGH |
| 43489 | 0.901 | 0.002 | 0.391 | 0.002 | HIGH |
| 43490 | 0.392 | 0.001 | 0.124 | 0.001 | HIGH |

5.5.193

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43491 | -0.254 | 0.000 | 0.103 | 0.001 | HIGH |
| 43492 | 3.022 | 0.006 | 0.317 | 0.002 | HIGH |
| 43499 | -1.732 | 0.003 | 0.288 | 0.002 | HIGH |
| 43500 | -1.002 | 0.002 | 0.208 | 0.001 | HIGH |
| 43501 | -0.525 | 0.001 | 0.206 | 0.001 | HIGH |
| 43502 | -0.400 | 0.001 | 0.117 | 0.001 | HIGH |
| 43503 | -0.428 | 0.001 | 0.043 | 0.000 | HIGH |
| 43504 | -0.902 | 0.002 | 0.069 | 0.001 | HIGH |
| 43505 | -1.845 | 0.003 | 0.145 | 0.001 | HIGH |
| 43509 | -1.613 | 0.003 | 0.495 | 0.003 | HIGH |
| 43510 | -0.718 | 0.001 | 0.456 | 0.003 | HIGH |
| 43511 | -0.390 | 0.001 | 0.353 | 0.002 | HIGH |
| 43512 | -0.216 | 0.000 | 0.108 | 0.001 | HIGH |
| 43513 | -0.355 | 0.001 | 0.188 | 0.001 | HIGH |
| 43514 | -0.796 | 0.002 | 0.205 | 0.001 | HIGH |
| 43515 | -1.332 | 0.003 | 0.205 | 0.001 | HIGH |
| 43518 | -0.823 | 0.002 | 1.165 | 0.007 | HIGH |
| 43519 | -0.275 | 0.001 | 0.735 | 0.005 | HIGH |
| 43520 | -0.168 | 0.000 | 0.630 | 0.004 | HIGH |
| 43521 | 0.143 | 0.000 | 0.262 | 0.002 | HIGH |
| 43522 | 0.178 | 0.000 | 0.259 | 0.002 | HIGH |
| 43523 | -0.126 | 0.000 | 0.358 | 0.002 | HIGH |
| 43524 | -0.583 | 0.001 | 0.371 | 0.002 | HIGH |
| 43526 | -0.097 | 0.000 | 2.427 | 0.016 | HIGH |
| 43528 | 1.784 | 0.003 | 1.612 | 0.010 | HIGH |
| 43529 | 0.929 | 0.002 | 0.486 | 0.003 | HIGH |
| 43530 | 0.921 | 0.002 | 0.246 | 0.002 | HIGH |
| 43531 | 0.767 | 0.001 | 0.490 | 0.003 | HIGH |
| 43532 | 0.434 | 0.001 | 0.514 | 0.003 | HIGH |
| 43534 | 0.968 | 0.002 | 2.254 | 0.014 | HIGH |
| 43537 | 0.133 | 0.000 | 1.980 | 0.013 | HIGH |
| 43538 | 1.294 | 0.002 | 0.431 | 0.003 | HIGH |
| 43539 | 1.498 | 0.003 | 0.483 | 0.003 | HIGH |
| 43540 | 1.368 | 0.003 | 0.820 | 0.005 | HIGH |
| 43544 | 1.014 | 0.002 | 3.814 | 0.024 | HIGH |
| 43547 | 2.896 | 0.005 | 0.570 | 0.004 | HIGH |
| 43548 | 2.130 | 0.004 | 0.554 | 0.004 | HIGH |
| 43549 | 2.076 | 0.004 | 0.252 | 0.002 | HIGH |
| 43550 | 1.937 | 0.004 | 0.913 | 0.006 | HIGH |
| 43553 | 3.211 | 0.006 | 0.936 | 0.006 | HIGH |
| 43554 | 4.180 | 0.008 | 1.543 | 0.010 | HIGH |
| 43556 | 1.614 | 0.003 | 0.485 | 0.003 | HIGH |
| 43557 | 3.250 | 0.006 | 0.440 | 0.003 | HIGH |
| 43558 | 2.518 | 0.005 | 0.438 | 0.003 | HIGH |
| 43559 | 2.129 | 0.004 | 0.602 | 0.004 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43561 | 4.057 | 0.008 | 0.514 | 0.003 | HIGH |
| 43562 | 3.987 | 0.008 | 0.556 | 0.004 | HIGH |
| 43563 | 3.267 | 0.006 | 0.801 | 0.005 | HIGH |
| 43564 | 2.108 | 0.004 | 0.456 | 0.003 | HIGH |
| 43565 | 3.005 | 0.006 | 0.348 | 0.002 | HIGH |
| 43566 | 2.696 | 0.005 | 0.362 | 0.002 | HIGH |
| 43567 | 2.164 | 0.004 | 0.366 | 0.002 | HIGH |
| 43568 | 2.992 | 0.006 | 0.309 | 0.002 | HIGH |
| 43569 | 3.477 | 0.007 | 0.264 | 0.002 | HIGH |
| 43570 | 3.157 | 0.006 | 0.514 | 0.003 | HIGH |
| 43571 | 3.190 | 0.006 | 0.529 | 0.003 | HIGH |
| 43572 | 2.708 | 0.005 | 0.420 | 0.003 | HIGH |
| 43573 | 2.540 | 0.005 | 0.342 | 0.002 | HIGH |
| 43574 | 2.128 | 0.004 | 0.408 | 0.003 | HIGH |
| 43575 | 2.973 | 0.006 | 0.352 | 0.002 | HIGH |
| 43576 | 3.015 | 0.006 | 0.250 | 0.002 | HIGH |
| 43577 | 3.010 | 0.006 | 0.343 | 0.002 | HIGH |
| 43578 | 2.787 | 0.005 | 0.342 | 0.002 | HIGH |
| 43579 | 2.298 | 0.004 | 0.192 | 0.001 | HIGH |
| 43580 | 1.879 | 0.004 | 0.591 | 0.004 | HIGH |
| 43581 | 2.937 | 0.006 | 0.210 | 0.001 | HIGH |
| 43582 | 2.876 | 0.005 | 0.203 | 0.001 | HIGH |
| 43583 | 2.574 | 0.005 | 0.203 | 0.001 | HIGH |
| 43584 | 2.039 | 0.004 | 0.158 | 0.001 | HIGH |
| 43585 | 1.483 | 0.003 | 0.517 | 0.003 | HIGH |
| 43586 | 2.879 | 0.005 | 0.058 | 0.000 | HIGH |
| 43587 | 2.398 | 0.005 | 0.081 | 0.001 | HIGH |
| 43588 | 1.666 | 0.003 | 0.071 | 0.000 | HIGH |
| 43589 | 0.999 | 0.002 | 0.320 | 0.002 | HIGH |
| 43590 | 1.753 | 0.003 | 0.060 | 0.000 | HIGH |
| 43591 | 1.022 | 0.002 | 0.057 | 0.000 | HIGH |
| 43592 | 0.246 | 0.000 | 0.137 | 0.001 | HIGH |
| 43594 | -1.819 | 0.003 | 0.168 | 0.001 | HIGH |
| 52201 | -0.473 | 0.001 | 1.100 | 0.007 | HIGH |
| 52202 | -5.248 | 0.010 | 0.497 | 0.003 | HIGH |
| 52204 | 0.973 | 0.002 | 0.115 | 0.001 | HIGH |
| 52205 | 2.114 | 0.004 | 0.033 | 0.000 | HIGH |
| 52206 | -2.558 | 0.005 | 0.083 | 0.001 | HIGH |
| 52207 | 6.344 | 0.012 | 0.689 | 0.004 | HIGH |
| 52208 | -4.433 | 0.008 | 0.295 | 0.002 | HIGH |
| 52215 | 0.017 | 0.000 | 2.959 | 0.019 | HIGH |
| 52216 | -0.671 | 0.001 | 0.747 | 0.005 | HIGH |
| 52222 | 7.038 | 0.013 | 0.162 | 0.001 | HIGH |
| 52223 | 8.418 | 0.016 | 0.951 | 0.006 | HIGH |
| 52224 | -0.683 | 0.001 | 3.993 | 0.025 | HIGH |

5.5.145

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52225 | -0.212 | 0.000 | 1.679 | 0.011 | HIGH |
| 52226 | 0.984 | 0.002 | 0.098 | 0.001 | HIGH |
| 52227 | 2.356 | 0.004 | 0.035 | 0.000 | HIGH |
| 52228 | 2.130 | 0.004 | 0.071 | 0.000 | HIGH |
| 52229 | 1.767 | 0.003 | 0.084 | 0.001 | HIGH |
| 52230 | 3.571 | 0.007 | 0.815 | 0.005 | HIGH |
| 52231 | 5.645 | 0.011 | 1.251 | 0.008 | HIGH |
| 52232 | 7.045 | 0.013 | 0.965 | 0.006 | HIGH |
| 52233 | 3.835 | 0.007 | 2.234 | 0.014 | HIGH |
| 52234 | -0.615 | 0.001 | 2.475 | 0.016 | HIGH |
| 52235 | -0.120 | 0.000 | 1.713 | 0.011 | HIGH |
| 52236 | 0.716 | 0.001 | 0.105 | 0.001 | HIGH |
| 52237 | 1.077 | 0.002 | 0.067 | 0.000 | HIGH |
| 52238 | 2.772 | 0.005 | 0.108 | 0.001 | HIGH |
| 52239 | 3.430 | 0.006 | 0.252 | 0.002 | HIGH |
| 52240 | 5.003 | 0.009 | 0.355 | 0.002 | HIGH |
| 52241 | 1.519 | 0.003 | 7.817 | 0.050 | HIGH |
| 52242 | 2.118 | 0.004 | 27.877 | 0.178 | HIGH |
| 52243 | 0.587 | 0.001 | 0.127 | 0.001 | HIGH |
| 52244 | 2.574 | 0.005 | 28.361 | 0.181 | HIGH |
| 52245 | -0.630 | 0.001 | 0.963 | 0.006 | HIGH |
| 52246 | -0.314 | 0.001 | 1.012 | 0.006 | HIGH |
| 52247 | 1.056 | 0.002 | 0.052 | 0.000 | HIGH |
| 52248 | 0.772 | 0.001 | 0.035 | 0.000 | HIGH |
| 52249 | 1.937 | 0.004 | 0.082 | 0.001 | HIGH |
| 52250 | 2.993 | 0.006 | 0.202 | 0.001 | HIGH |
| 52251 | 2.887 | 0.005 | 1.202 | 0.008 | HIGH |
| 52252 | 1.627 | 0.003 | 3.684 | 0.024 | HIGH |
| 52253 | 2.028 | 0.004 | 3.721 | 0.024 | HIGH |
| 52254 | 2.158 | 0.004 | 14.406 | 0.092 | HIGH |
| 52255 | -3.867 | 0.007 | 16.716 | 0.107 | HIGH |
| 52256 | -3.708 | 0.007 | 2.737 | 0.017 | HIGH |
| 52257 | -0.833 | 0.002 | 0.390 | 0.002 | HIGH |
| 52258 | -0.006 | 0.000 | 0.371 | 0.002 | HIGH |
| 52259 | -0.428 | 0.001 | 0.487 | 0.003 | HIGH |
| 52260 | 0.835 | 0.002 | 0.051 | 0.000 | HIGH |
| 52261 | 2.856 | 0.005 | 0.171 | 0.001 | HIGH |
| 52262 | 0.123 | 0.000 | 0.081 | 0.001 | HIGH |
| 52263 | 1.519 | 0.003 | 0.393 | 0.003 | HIGH |
| 52264 | 0.941 | 0.002 | 1.418 | 0.009 | HIGH |
| 52265 | 0.604 | 0.001 | 1.530 | 0.010 | HIGH |
| 52266 | -0.167 | 0.000 | 4.072 | 0.026 | HIGH |
| 52267 | -1.543 | 0.003 | 7.025 | 0.045 | HIGH |
| 52268 | -1.625 | 0.003 | 3.599 | 0.023 | HIGH |
| 52269 | -2.753 | 0.005 | 1.427 | 0.009 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52270 | 2.304 | 0.004 | 0.166 | 0.001 | HIGH |
| 52271 | 1.772 | 0.003 | 0.084 | 0.001 | HIGH |
| 52272 | 1.618 | 0.003 | 0.246 | 0.002 | HIGH |
| 52273 | 1.640 | 0.003 | 0.188 | 0.001 | HIGH |
| 52274 | 1.168 | 0.002 | 0.149 | 0.001 | HIGH |
| 52275 | -4.331 | 0.008 | 0.282 | 0.002 | HIGH |
| 52278 | 1.882 | 0.004 | 0.074 | 0.000 | HIGH |
| 52279 | 2.734 | 0.005 | 0.150 | 0.001 | HIGH |
| 52280 | 0.058 | 0.000 | 0.008 | 0.000 | HIGH |
| 52281 | 2.681 | 0.005 | 0.047 | 0.000 | HIGH |
| 52282 | 0.986 | 0.002 | 0.060 | 0.000 | HIGH |
| 52283 | -1.067 | 0.002 | 0.424 | 0.003 | HIGH |
| 52286 | 3.578 | 0.007 | 0.260 | 0.002 | HIGH |
| 52287 | 3.018 | 0.006 | 0.012 | 0.000 | HIGH |
| 52288 | 2.497 | 0.005 | 0.012 | 0.000 | HIGH |
| 52289 | 2.405 | 0.005 | 0.014 | 0.000 | HIGH |
| 52290 | 2.878 | 0.005 | 0.093 | 0.001 | HIGH |
| 52293 | 2.757 | 0.005 | 0.350 | 0.002 | HIGH |
| 52294 | 3.753 | 0.007 | 0.055 | 0.000 | HIGH |
| 52295 | 0.113 | 0.000 | 0.008 | 0.000 | HIGH |
| 52296 | 5.325 | 0.010 | 0.022 | 0.000 | HIGH |
| 52297 | 5.818 | 0.011 | 0.061 | 0.000 | HIGH |
| 52300 | 4.964 | 0.009 | 0.395 | 0.003 | HIGH |
| 52301 | 5.005 | 0.009 | 0.019 | 0.000 | HIGH |
| 52302 | 5.917 | 0.011 | 0.053 | 0.000 | HIGH |
| 52303 | 5.333 | 0.010 | 0.050 | 0.000 | HIGH |
| 52304 | 5.680 | 0.011 | 0.073 | 0.000 | HIGH |
| 52308 | 7.952 | 0.015 | 0.259 | 0.002 | HIGH |
| 52309 | 6.553 | 0.012 | 0.120 | 0.001 | HIGH |
| 52310 | 6.683 | 0.013 | 0.188 | 0.001 | HIGH |
| 52311 | 5.139 | 0.010 | 0.156 | 0.001 | HIGH |
| 52312 | 2.747 | 0.005 | 0.071 | 0.000 | HIGH |
| 52316 | 7.967 | 0.015 | 0.417 | 0.003 | HIGH |
| 52317 | 8.662 | 0.016 | 0.412 | 0.003 | HIGH |
| 52318 | 9.948 | 0.019 | 0.856 | 0.005 | HIGH |
| 52319 | 1.733 | 0.003 | 1.339 | 0.009 | HIGH |
| 52320 | -0.368 | 0.001 | 0.749 | 0.005 | HIGH |
| 52323 | 8.181 | 0.015 | 1.780 | 0.011 | HIGH |
| 52324 | 8.621 | 0.016 | 1.536 | 0.010 | HIGH |
| 52325 | 8.233 | 0.016 | 5.328 | 0.034 | HIGH |
| 52326 | 7.686 | 0.015 | 14.365 | 0.092 | HIGH |
| 52327 | -6.552 | 0.012 | 0.551 | 0.004 | HIGH |
| 52329 | 7.949 | 0.015 | 4.015 | 0.026 | HIGH |
| 52330 | 8.824 | 0.017 | 4.976 | 0.032 | HIGH |
| 52331 | 8.720 | 0.016 | 14.527 | 0.093 | HIGH |

S.S.197

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52332 | 2.533 | 0.005 | 16.845 | 0.108 | HIGH |
| 52333 | 4.726 | 0.009 | 2.208 | 0.014 | HIGH |
| 52334 | 7.618 | 0.014 | 9.678 | 0.062 | HIGH |
| 52335 | 9.103 | 0.017 | 26.518 | 0.169 | HIGH |
| 52336 | 1.258 | 0.002 | 0.046 | 0.000 | HIGH |
| 52337 | 15.558 | 0.029 | 28.384 | 0.181 | HIGH |
| 52338 | 5.242 | 0.010 | 7.809 | 0.050 | HIGH |
| 52339 | 5.314 | 0.010 | 10.966 | 0.070 | HIGH |
| 52340 | 13.032 | 0.025 | 2.432 | 0.016 | HIGH |
| 52341 | 3.136 | 0.006 | 0.430 | 0.003 | HIGH |
| 52342 | 4.485 | 0.008 | 0.845 | 0.005 | HIGH |
| 52343 | 0.058 | 0.000 | 0.416 | 0.003 | HIGH |
| 52346 | -1.737 | 0.003 | 0.040 | 0.000 | HIGH |
| 52347 | 1.955 | 0.004 | 0.290 | 0.002 | HIGH |
| 52348 | -1.875 | 0.004 | 6.891 | 0.044 | HIGH |
| 52349 | -3.535 | 0.007 | 8.904 | 0.057 | HIGH |
| 52350 | -3.045 | 0.006 | 2.070 | 0.013 | HIGH |
| 52351 | -1.816 | 0.003 | 0.437 | 0.003 | HIGH |
| 52353 | 0.470 | 0.001 | 0.113 | 0.001 | HIGH |
| 52354 | -2.883 | 0.005 | 0.226 | 0.001 | HIGH |
| 52355 | -1.476 | 0.003 | 27.316 | 0.174 | HIGH |
| 52356 | -0.673 | 0.001 | 0.045 | 0.000 | HIGH |
| 52357 | -3.102 | 0.006 | 16.997 | 0.109 | HIGH |
| 52358 | -2.971 | 0.006 | 4.566 | 0.029 | HIGH |
| 52361 | -1.861 | 0.004 | 1.899 | 0.012 | HIGH |
| 52362 | -3.986 | 0.008 | 4.807 | 0.031 | HIGH |
| 52363 | -4.566 | 0.009 | 6.661 | 0.043 | HIGH |
| 52364 | -4.678 | 0.009 | 6.154 | 0.039 | HIGH |
| 52365 | -3.217 | 0.006 | 10.317 | 0.066 | HIGH |
| 52368 | -4.992 | 0.009 | 0.136 | 0.001 | HIGH |
| 52369 | -6.785 | 0.013 | 0.092 | 0.001 | HIGH |
| 52370 | -5.708 | 0.011 | 7.464 | 0.048 | HIGH |
| 52371 | -6.093 | 0.011 | 3.617 | 0.023 | HIGH |
| 52372 | -5.245 | 0.010 | 7.379 | 0.047 | HIGH |
| 52375 | -7.698 | 0.015 | 0.050 | 0.000 | HIGH |
| 52376 | -7.313 | 0.014 | 0.098 | 0.001 | HIGH |
| 52377 | -8.855 | 0.017 | 0.818 | 0.005 | HIGH |
| 52378 | -7.595 | 0.014 | 1.555 | 0.010 | HIGH |
| 52379 | -7.199 | 0.014 | 2.175 | 0.014 | HIGH |
| 52383 | -8.646 | 0.016 | 0.059 | 0.000 | HIGH |
| 52384 | -8.381 | 0.016 | 0.055 | 0.000 | HIGH |
| 52385 | -9.001 | 0.017 | 0.130 | 0.001 | HIGH |
| 52386 | -8.890 | 0.017 | 0.195 | 0.001 | HIGH |
| 52387 | -8.237 | 0.016 | 0.168 | 0.001 | HIGH |
| 52390 | -7.086 | 0.013 | 0.058 | 0.000 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52391 | -6.471 | 0.012 | 0.040 | 0.000 | HIGH |
| 52392 | -8.809 | 0.017 | 0.092 | 0.001 | HIGH |
| 52393 | -9.434 | 0.018 | 0.057 | 0.000 | HIGH |
| 52394 | -7.953 | 0.015 | 0.139 | 0.001 | HIGH |
| 52396 | -7.263 | 0.014 | 0.608 | 0.004 | HIGH |
| 52397 | -6.457 | 0.012 | 0.047 | 0.000 | HIGH |
| 52398 | -6.700 | 0.013 | 0.043 | 0.000 | HIGH |
| 52399 | -6.416 | 0.012 | 0.080 | 0.001 | HIGH |
| 52400 | -8.200 | 0.015 | 0.183 | 0.001 | HIGH |
| 52401 | -6.238 | 0.012 | 1.806 | 0.012 | HIGH |
| 52402 | -6.049 | 0.011 | 0.979 | 0.006 | HIGH |
| 52403 | -6.621 | 0.012 | 0.078 | 0.000 | HIGH |
| 52404 | -6.993 | 0.013 | 0.048 | 0.000 | HIGH |
| 52405 | -3.914 | 0.007 | 1.108 | 0.007 | HIGH |
| 52406 | -5.760 | 0.011 | 3.357 | 0.021 | HIGH |
| 52407 | -5.864 | 0.011 | 0.962 | 0.006 | HIGH |
| 52408 | -6.206 | 0.012 | 0.053 | 0.000 | HIGH |
| 52409 | -6.839 | 0.013 | 0.291 | 0.002 | HIGH |
| 52410 | -5.093 | 0.010 | 2.962 | 0.019 | HIGH |
| 52411 | -5.286 | 0.010 | 0.381 | 0.002 | HIGH |
| 52412 | -5.014 | 0.009 | 0.318 | 0.002 | HIGH |
| 52413 | -3.919 | 0.007 | 1.301 | 0.008 | HIGH |
| 52414 | -4.463 | 0.008 | 0.202 | 0.001 | HIGH |
| 52415 | -2.013 | 0.004 | 0.297 | 0.002 | HIGH |
| 52425 | 0.095 | 0.000 | 0.341 | 0.002 | HIGH |
| 52426 | -5.795 | 0.011 | 0.112 | 0.001 | HIGH |
| 52427 | 0.011 | 0.000 | 0.167 | 0.001 | HIGH |
| 52443 | 0.629 | 0.001 | 0.052 | 0.000 | HIGH |
| 52444 | 0.539 | 0.001 | 0.075 | 0.000 | HIGH |
| 52445 | -6.864 | 0.013 | 0.099 | 0.001 | HIGH |
| 52446 | 0.078 | 0.000 | 0.205 | 0.001 | HIGH |
| 52447 | -2.729 | 0.005 | 0.888 | 0.006 | HIGH |
| 52463 | -7.146 | 0.013 | 0.203 | 0.001 | HIGH |
| 52464 | 4.105 | 0.008 | 0.440 | 0.003 | HIGH |
| 52465 | -4.396 | 0.008 | 0.291 | 0.002 | HIGH |
| 53301 | 0.607 | 0.001 | 0.157 | 0.001 | HIGH |
| 53302 | -3.032 | 0.006 | 0.065 | 0.000 | HIGH |
| 53303 | -3.686 | 0.007 | 0.027 | 0.000 | HIGH |
| 53304 | 3.017 | 0.006 | 0.083 | 0.001 | HIGH |
| 53305 | -4.151 | 0.008 | 0.080 | 0.001 | HIGH |
| 53306 | 3.918 | 0.007 | 0.031 | 0.000 | HIGH |
| 53307 | -1.851 | 0.003 | 0.054 | 0.000 | HIGH |
| 53308 | 4.102 | 0.008 | 0.041 | 0.000 | HIGH |
| 53313 | 1.512 | 0.003 | 0.262 | 0.002 | HIGH |
| 53314 | 1.871 | 0.004 | 0.058 | 0.000 | HIGH |

S.S.179

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53319 | -3.176 | 0.006 | 0.045 | 0.000 | HIGH |
| 53320 | -3.064 | 0.006 | 0.027 | 0.000 | HIGH |
| 53321 | 2.315 | 0.004 | 0.264 | 0.002 | HIGH |
| 53322 | 2.501 | 0.005 | 0.085 | 0.001 | HIGH |
| 53323 | 2.312 | 0.004 | 0.098 | 0.001 | HIGH |
| 53324 | -2.195 | 0.004 | 0.108 | 0.001 | HIGH |
| 53327 | 1.300 | 0.002 | 0.083 | 0.001 | HIGH |
| 53328 | -2.949 | 0.006 | 0.065 | 0.000 | HIGH |
| 53329 | -4.008 | 0.008 | 0.053 | 0.000 | HIGH |
| 53330 | -4.288 | 0.008 | 0.047 | 0.000 | HIGH |
| 53331 | 2.075 | 0.004 | 0.169 | 0.001 | HIGH |
| 53332 | 1.782 | 0.003 | 0.114 | 0.001 | HIGH |
| 53333 | 2.252 | 0.004 | 0.139 | 0.001 | HIGH |
| 53334 | -0.121 | 0.000 | 0.292 | 0.002 | HIGH |
| 53338 | -1.165 | 0.002 | 0.225 | 0.001 | HIGH |
| 53339 | -3.454 | 0.007 | 0.093 | 0.001 | HIGH |
| 53340 | -3.311 | 0.006 | 0.037 | 0.000 | HIGH |
| 53341 | -3.870 | 0.007 | 0.067 | 0.000 | HIGH |
| 53342 | 1.461 | 0.003 | 0.088 | 0.001 | HIGH |
| 53343 | 1.140 | 0.002 | 0.102 | 0.001 | HIGH |
| 53344 | 1.240 | 0.002 | 0.134 | 0.001 | HIGH |
| 53345 | 1.153 | 0.002 | 0.363 | 0.002 | HIGH |
| 53350 | -2.060 | 0.004 | 0.256 | 0.002 | HIGH |
| 53351 | -2.198 | 0.004 | 0.105 | 0.001 | HIGH |
| 53352 | -2.453 | 0.005 | 0.043 | 0.000 | HIGH |
| 53353 | -3.250 | 0.006 | 0.065 | 0.000 | HIGH |
| 53354 | 0.234 | 0.000 | 0.043 | 0.000 | HIGH |
| 53355 | 0.580 | 0.001 | 0.054 | 0.000 | HIGH |
| 53356 | 0.913 | 0.002 | 0.060 | 0.000 | HIGH |
| 53357 | 0.535 | 0.001 | 0.234 | 0.001 | HIGH |
| 53363 | -0.687 | 0.001 | 0.204 | 0.001 | HIGH |
| 53364 | -1.527 | 0.003 | 0.042 | 0.000 | HIGH |
| 53365 | -1.897 | 0.004 | 0.045 | 0.000 | HIGH |
| 53366 | -2.613 | 0.005 | 0.044 | 0.000 | HIGH |
| 53367 | -1.092 | 0.002 | 0.085 | 0.001 | HIGH |
| 53368 | 0.049 | 0.000 | 0.035 | 0.000 | HIGH |
| 53369 | 0.698 | 0.001 | 0.031 | 0.000 | HIGH |
| 53370 | 0.957 | 0.002 | 0.090 | 0.001 | HIGH |
| 53371 | -0.035 | 0.000 | 0.113 | 0.001 | HIGH |
| 53376 | 0.827 | 0.002 | 0.167 | 0.001 | HIGH |
| 53377 | -0.648 | 0.001 | 0.050 | 0.000 | HIGH |
| 53378 | -1.165 | 0.002 | 0.023 | 0.000 | HIGH |
| 53379 | -1.427 | 0.003 | 0.028 | 0.000 | HIGH |
| 53380 | -1.961 | 0.004 | 0.030 | 0.000 | HIGH |
| 53382 | 0.317 | 0.001 | 0.051 | 0.000 | HIGH |

S.S. 200

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53383 | 0.544 | 0.001 | 0.017 | 0.000 | HIGH |
| 53384 | 0.826 | 0.002 | 0.022 | 0.000 | HIGH |
| 53385 | 0.783 | 0.001 | 0.040 | 0.000 | HIGH |
| 53386 | 0.687 | 0.001 | 0.065 | 0.000 | HIGH |
| 53390 | 0.461 | 0.001 | 0.108 | 0.001 | HIGH |
| 53391 | 0.251 | 0.000 | 0.011 | 0.000 | HIGH |
| 53392 | -0.381 | 0.001 | 0.009 | 0.000 | HIGH |
| 53393 | -0.623 | 0.001 | 0.010 | 0.000 | HIGH |
| 53394 | -0.852 | 0.002 | 0.008 | 0.000 | HIGH |
| 53395 | -1.164 | 0.002 | 0.022 | 0.000 | HIGH |
| 53397 | 3.403 | 0.006 | 0.152 | 0.001 | HIGH |
| 53398 | 1.810 | 0.003 | 0.021 | 0.000 | HIGH |
| 53399 | 0.947 | 0.002 | 0.008 | 0.000 | HIGH |
| 53400 | 0.552 | 0.001 | 0.022 | 0.000 | HIGH |
| 53401 | -0.034 | 0.000 | 0.034 | 0.000 | HIGH |
| 53402 | -1.180 | 0.002 | 0.024 | 0.000 | HIGH |
| 53403 | -3.658 | 0.007 | 0.143 | 0.001 | HIGH |
| 53406 | 2.195 | 0.004 | 0.059 | 0.000 | HIGH |
| 53407 | 2.269 | 0.004 | 0.046 | 0.000 | HIGH |
| 53408 | 1.634 | 0.003 | 0.014 | 0.000 | HIGH |
| 53409 | 1.313 | 0.002 | 0.002 | 0.000 | HIGH |
| 53410 | 1.224 | 0.002 | 0.017 | 0.000 | HIGH |
| 53411 | 0.765 | 0.001 | 0.030 | 0.000 | HIGH |
| 53412 | 0.503 | 0.001 | 0.078 | 0.000 | HIGH |
| 53413 | -2.680 | 0.005 | 0.102 | 0.001 | HIGH |
| 53415 | 1.954 | 0.004 | 0.030 | 0.000 | HIGH |
| 53416 | 2.011 | 0.004 | 0.026 | 0.000 | HIGH |
| 53417 | 1.766 | 0.003 | 0.017 | 0.000 | HIGH |
| 53418 | 2.154 | 0.004 | 0.043 | 0.000 | HIGH |
| 53419 | 2.249 | 0.004 | 0.057 | 0.000 | HIGH |
| 53420 | 2.139 | 0.004 | 0.064 | 0.000 | HIGH |
| 53421 | 3.818 | 0.007 | 0.076 | 0.000 | HIGH |
| 53424 | 1.485 | 0.003 | 0.055 | 0.000 | HIGH |
| 53425 | 1.856 | 0.004 | 0.053 | 0.000 | HIGH |
| 53426 | 2.855 | 0.005 | 0.083 | 0.001 | HIGH |
| 53432 | 0.198 | 0.000 | 0.111 | 0.001 | HIGH |
| 53433 | 0.579 | 0.001 | 0.104 | 0.001 | HIGH |
| 53440 | -1.366 | 0.003 | 0.213 | 0.001 | HIGH |
| 53450 | -0.800 | 0.002 | 0.718 | 0.005 | HIGH |
| 53455 | 2.718 | 0.005 | 0.205 | 0.001 | HIGH |
| 53456 | 5.436 | 0.010 | 0.033 | 0.000 | HIGH |
| 53457 | 1.086 | 0.002 | 0.062 | 0.000 | HIGH |
| 53463 | 5.250 | 0.010 | 0.106 | 0.001 | HIGH |
| 53464 | 5.779 | 0.011 | 0.096 | 0.001 | HIGH |
| 53465 | 6.483 | 0.012 | 0.051 | 0.000 | HIGH |

5-5-201

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53467 | -0.333 | 0.001 | 0.313 | 0.002 | HIGH |
| 53470 | 5.048 | 0.010 | 0.109 | 0.001 | HIGH |
| 53471 | 5.203 | 0.010 | 0.104 | 0.001 | HIGH |
| 53472 | 5.076 | 0.010 | 0.029 | 0.000 | HIGH |
| 53473 | 4.566 | 0.009 | 0.061 | 0.000 | HIGH |
| 53474 | 0.317 | 0.001 | 0.260 | 0.002 | HIGH |
| 53475 | 1.334 | 0.003 | 0.043 | 0.000 | HIGH |
| 53476 | 2.819 | 0.005 | 0.068 | 0.000 | HIGH |
| 53477 | 3.671 | 0.007 | 0.066 | 0.000 | HIGH |
| 53478 | 3.940 | 0.007 | 0.044 | 0.000 | HIGH |
| 53479 | 3.749 | 0.007 | 0.065 | 0.000 | HIGH |
| 53480 | 1.221 | 0.002 | 0.187 | 0.001 | HIGH |
| 53481 | 2.031 | 0.004 | 0.045 | 0.000 | HIGH |
| 53482 | 2.563 | 0.005 | 0.045 | 0.000 | HIGH |
| 53483 | 2.950 | 0.006 | 0.043 | 0.000 | HIGH |
| 53484 | 3.105 | 0.006 | 0.057 | 0.000 | HIGH |
| 53485 | 1.489 | 0.003 | 0.110 | 0.001 | HIGH |
| 53486 | 1.871 | 0.004 | 0.027 | 0.000 | HIGH |
| 53487 | 2.151 | 0.004 | 0.026 | 0.000 | HIGH |
| 53488 | 2.363 | 0.004 | 0.047 | 0.000 | HIGH |
| 53489 | 1.193 | 0.002 | 0.055 | 0.000 | HIGH |
| 53490 | 1.494 | 0.003 | 0.005 | 0.000 | HIGH |
| 53491 | 1.664 | 0.003 | 0.035 | 0.000 | HIGH |
| 53492 | 0.880 | 0.002 | 0.027 | 0.000 | HIGH |
| 53493 | 0.996 | 0.002 | 0.015 | 0.000 | HIGH |
| 53494 | 0.183 | 0.000 | 0.021 | 0.000 | HIGH |
| 53499 | 3.375 | 0.006 | 0.044 | 0.000 | HIGH |
| 53500 | 0.961 | 0.002 | 0.028 | 0.000 | HIGH |
| 53501 | 0.135 | 0.000 | 0.027 | 0.000 | HIGH |
| 53502 | -0.227 | 0.000 | 0.022 | 0.000 | HIGH |
| 53503 | -0.190 | 0.000 | 0.014 | 0.000 | HIGH |
| 53504 | -0.061 | 0.000 | 0.023 | 0.000 | HIGH |
| 53505 | 0.077 | 0.000 | 0.021 | 0.000 | HIGH |
| 53506 | 0.221 | 0.000 | 0.007 | 0.000 | HIGH |
| 53509 | -1.686 | 0.003 | 0.037 | 0.000 | HIGH |
| 53510 | -1.185 | 0.002 | 0.048 | 0.000 | HIGH |
| 53511 | -1.317 | 0.002 | 0.050 | 0.000 | HIGH |
| 53512 | -1.054 | 0.002 | 0.034 | 0.000 | HIGH |
| 53513 | -0.674 | 0.001 | 0.036 | 0.000 | HIGH |
| 53514 | -0.401 | 0.001 | 0.040 | 0.000 | HIGH |
| 53515 | -0.055 | 0.000 | 0.041 | 0.000 | HIGH |
| 53518 | -4.230 | 0.008 | 0.114 | 0.001 | HIGH |
| 53519 | -2.362 | 0.004 | 0.076 | 0.000 | HIGH |
| 53520 | -2.642 | 0.005 | 0.063 | 0.000 | HIGH |
| 53521 | -2.497 | 0.005 | 0.058 | 0.000 | HIGH |

5.5.202

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53522 | -1.650 | 0.003 | 0.038 | 0.000 | HIGH |
| 53523 | -1.123 | 0.002 | 0.074 | 0.000 | HIGH |
| 53524 | -0.711 | 0.001 | 0.077 | 0.000 | HIGH |
| 53530 | -3.578 | 0.007 | 0.104 | 0.001 | HIGH |
| 53531 | -2.098 | 0.004 | 0.098 | 0.001 | HIGH |
| 53532 | -1.297 | 0.002 | 0.110 | 0.001 | HIGH |
| 53539 | -2.183 | 0.004 | 0.163 | 0.001 | HIGH |
| 53540 | -1.477 | 0.003 | 0.206 | 0.001 | HIGH |
| 53550 | -0.645 | 0.001 | 0.415 | 0.003 | HIGH |
| 53553 | -6.054 | 0.011 | 0.025 | 0.000 | HIGH |
| 53554 | -3.166 | 0.006 | 0.209 | 0.001 | HIGH |
| 53559 | 0.422 | 0.001 | 0.278 | 0.002 | HIGH |
| 53561 | -5.701 | 0.011 | 0.092 | 0.001 | HIGH |
| 53562 | -5.744 | 0.011 | 0.094 | 0.001 | HIGH |
| 53563 | -5.071 | 0.010 | 0.099 | 0.001 | HIGH |
| 53568 | -3.726 | 0.007 | 0.219 | 0.001 | HIGH |
| 53569 | -4.427 | 0.008 | 0.113 | 0.001 | HIGH |
| 53570 | -4.880 | 0.009 | 0.139 | 0.001 | HIGH |
| 53571 | -4.776 | 0.009 | 0.153 | 0.001 | HIGH |
| 53574 | -0.742 | 0.001 | 0.126 | 0.001 | HIGH |
| 53575 | -3.247 | 0.006 | 0.361 | 0.002 | HIGH |
| 53576 | -3.494 | 0.007 | 0.101 | 0.001 | HIGH |
| 53577 | -3.578 | 0.007 | 0.103 | 0.001 | HIGH |
| 53578 | -3.184 | 0.006 | 0.102 | 0.001 | HIGH |
| 53579 | -2.181 | 0.004 | 0.054 | 0.000 | HIGH |
| 53580 | -1.805 | 0.003 | 0.137 | 0.001 | HIGH |
| 53581 | -2.578 | 0.005 | 0.331 | 0.002 | HIGH |
| 53582 | -2.677 | 0.005 | 0.062 | 0.000 | HIGH |
| 53583 | -2.991 | 0.006 | 0.089 | 0.001 | HIGH |
| 53584 | -3.230 | 0.006 | 0.085 | 0.001 | HIGH |
| 53585 | -2.922 | 0.006 | 0.125 | 0.001 | HIGH |
| 53586 | -1.657 | 0.003 | 0.212 | 0.001 | HIGH |
| 53587 | -2.205 | 0.004 | 0.081 | 0.001 | HIGH |
| 53588 | -2.832 | 0.005 | 0.083 | 0.001 | HIGH |
| 53589 | -2.809 | 0.005 | 0.084 | 0.001 | HIGH |
| 53590 | -1.188 | 0.002 | 0.102 | 0.001 | HIGH |
| 53591 | -2.346 | 0.004 | 0.080 | 0.001 | HIGH |
| 53592 | -2.268 | 0.004 | 0.073 | 0.000 | HIGH |
| 53594 | -2.992 | 0.006 | 0.068 | 0.000 | HIGH |
| 62201 | -7.041 | 0.013 | 0.689 | 0.004 | HIGH |
| 62202 | 4.816 | 0.009 | 0.172 | 0.001 | HIGH |
| 62203 | 4.218 | 0.008 | 0.101 | 0.001 | HIGH |
| 62204 | -4.646 | 0.009 | 0.153 | 0.001 | HIGH |
| 62205 | 0.141 | 0.000 | 0.058 | 0.000 | HIGH |
| 62206 | 1.107 | 0.002 | 0.123 | 0.001 | HIGH |

5.5.202

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62207 | 1.196 | 0.002 | 0.080 | 0.001 | HIGH |
| 62208 | 0.749 | 0.001 | 0.100 | 0.001 | HIGH |
| 62215 | -12.780 | 0.024 | 0.946 | 0.006 | HIGH |
| 62216 | -7.524 | 0.014 | 0.140 | 0.001 | HIGH |
| 62222 | 0.638 | 0.001 | 0.101 | 0.001 | HIGH |
| 62223 | 1.237 | 0.002 | 0.132 | 0.001 | HIGH |
| 62224 | -11.923 | 0.022 | 2.021 | 0.013 | HIGH |
| 62225 | -9.659 | 0.018 | 0.311 | 0.002 | HIGH |
| 62226 | -6.186 | 0.012 | 0.100 | 0.001 | HIGH |
| 62227 | -3.382 | 0.006 | 0.086 | 0.001 | HIGH |
| 62228 | -1.515 | 0.003 | 0.007 | 0.000 | HIGH |
| 62229 | -0.568 | 0.001 | 0.055 | 0.000 | HIGH |
| 62230 | -0.155 | 0.000 | 0.136 | 0.001 | HIGH |
| 62231 | 0.092 | 0.000 | 0.210 | 0.001 | HIGH |
| 62232 | 0.530 | 0.001 | 0.305 | 0.002 | HIGH |
| 62233 | 1.129 | 0.002 | 0.272 | 0.002 | HIGH |
| 62234 | -10.212 | 0.019 | 1.228 | 0.008 | HIGH |
| 62235 | -3.443 | 0.006 | 0.170 | 0.001 | HIGH |
| 62236 | -5.155 | 0.010 | 0.103 | 0.001 | HIGH |
| 62237 | -3.976 | 0.008 | 0.037 | 0.000 | HIGH |
| 62238 | -2.619 | 0.005 | 0.054 | 0.000 | HIGH |
| 62239 | -1.358 | 0.003 | 0.097 | 0.001 | HIGH |
| 62240 | -0.701 | 0.001 | 0.115 | 0.001 | HIGH |
| 62241 | -0.429 | 0.001 | 0.564 | 0.004 | HIGH |
| 62242 | -0.153 | 0.000 | 0.504 | 0.003 | HIGH |
| 62243 | 0.379 | 0.001 | 0.901 | 0.006 | HIGH |
| 62244 | 1.209 | 0.002 | 0.323 | 0.002 | HIGH |
| 62245 | -0.730 | 0.001 | 1.488 | 0.009 | HIGH |
| 62246 | -3.382 | 0.006 | 0.251 | 0.002 | HIGH |
| 62247 | -1.820 | 0.003 | 0.328 | 0.002 | HIGH |
| 62248 | -2.927 | 0.006 | 0.085 | 0.001 | HIGH |
| 62249 | -2.342 | 0.004 | 0.066 | 0.000 | HIGH |
| 62250 | -1.837 | 0.003 | 0.084 | 0.001 | HIGH |
| 62251 | -0.831 | 0.002 | 0.070 | 0.000 | HIGH |
| 62252 | -0.576 | 0.001 | 0.101 | 0.001 | HIGH |
| 62253 | -0.387 | 0.001 | 0.420 | 0.003 | HIGH |
| 62254 | 0.261 | 0.000 | 0.350 | 0.002 | HIGH |
| 62255 | 0.350 | 0.001 | 0.079 | 0.001 | HIGH |
| 62256 | 0.538 | 0.001 | 0.149 | 0.001 | HIGH |
| 62257 | -0.108 | 0.000 | 2.778 | 0.018 | HIGH |
| 62258 | -0.094 | 0.000 | 1.504 | 0.010 | HIGH |
| 62259 | -2.519 | 0.005 | 1.052 | 0.007 | HIGH |
| 62260 | -0.974 | 0.002 | 0.165 | 0.001 | HIGH |
| 62261 | -1.327 | 0.003 | 0.110 | 0.001 | HIGH |
| 62262 | -1.041 | 0.002 | 0.125 | 0.001 | HIGH |

S.S. 204

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62263 | -0.833 | 0.002 | 0.040 | 0.000 | HIGH |
| 62264 | -0.504 | 0.001 | 0.037 | 0.000 | HIGH |
| 62265 | -0.577 | 0.001 | 0.050 | 0.000 | HIGH |
| 62266 | -0.176 | 0.000 | 0.122 | 0.001 | HIGH |
| 62267 | 0.090 | 0.000 | 0.153 | 0.001 | HIGH |
| 62268 | 0.301 | 0.001 | 0.069 | 0.000 | HIGH |
| 62269 | 0.274 | 0.001 | 0.066 | 0.000 | HIGH |
| 62270 | 0.885 | 0.002 | 0.315 | 0.002 | HIGH |
| 62271 | 0.207 | 0.000 | 3.499 | 0.022 | HIGH |
| 62272 | 2.462 | 0.005 | 0.821 | 0.005 | HIGH |
| 62273 | 1.483 | 0.003 | 0.185 | 0.001 | HIGH |
| 62274 | 3.570 | 0.007 | 0.507 | 0.003 | HIGH |
| 62275 | 5.190 | 0.010 | 0.413 | 0.003 | HIGH |
| 62278 | 1.773 | 0.003 | 1.333 | 0.009 | HIGH |
| 62279 | 3.602 | 0.007 | 2.495 | 0.016 | HIGH |
| 62280 | 2.147 | 0.004 | 0.316 | 0.002 | HIGH |
| 62281 | 3.840 | 0.007 | 0.267 | 0.002 | HIGH |
| 62282 | -0.010 | 0.000 | 0.241 | 0.002 | HIGH |
| 62283 | 0.681 | 0.001 | 0.191 | 0.001 | HIGH |
| 62286 | 2.744 | 0.005 | 0.967 | 0.006 | HIGH |
| 62287 | 2.023 | 0.004 | 0.645 | 0.004 | HIGH |
| 62288 | 3.124 | 0.006 | 0.172 | 0.001 | HIGH |
| 62289 | 1.946 | 0.004 | 0.164 | 0.001 | HIGH |
| 62290 | -0.848 | 0.002 | 0.126 | 0.001 | HIGH |
| 62293 | 2.934 | 0.006 | 0.243 | 0.002 | HIGH |
| 62294 | 3.282 | 0.006 | 0.229 | 0.001 | HIGH |
| 62295 | 2.700 | 0.005 | 0.056 | 0.000 | HIGH |
| 62296 | 1.356 | 0.003 | 0.060 | 0.000 | HIGH |
| 62297 | -0.713 | 0.001 | 0.048 | 0.000 | HIGH |
| 62300 | 3.169 | 0.006 | 0.109 | 0.001 | HIGH |
| 62301 | 2.880 | 0.005 | 0.084 | 0.001 | HIGH |
| 62302 | 2.382 | 0.004 | 0.036 | 0.000 | HIGH |
| 62303 | 1.199 | 0.002 | 0.015 | 0.000 | HIGH |
| 62304 | 0.368 | 0.001 | 0.066 | 0.000 | HIGH |
| 62308 | 2.315 | 0.004 | 0.090 | 0.001 | HIGH |
| 62309 | 3.102 | 0.006 | 0.082 | 0.001 | HIGH |
| 62310 | 2.209 | 0.004 | 0.055 | 0.000 | HIGH |
| 62311 | 1.524 | 0.003 | 0.096 | 0.001 | HIGH |
| 62312 | 1.171 | 0.002 | 0.099 | 0.001 | HIGH |
| 62316 | 2.643 | 0.005 | 0.166 | 0.001 | HIGH |
| 62317 | 2.322 | 0.004 | 0.148 | 0.001 | HIGH |
| 62318 | 2.076 | 0.004 | 0.111 | 0.001 | HIGH |
| 62319 | 1.816 | 0.003 | 0.182 | 0.001 | HIGH |
| 62320 | 1.538 | 0.003 | 0.170 | 0.001 | HIGH |
| 62323 | 2.190 | 0.004 | 0.273 | 0.002 | HIGH |

5.5.205

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62324 | 2.270 | 0.004 | 0.228 | 0.001 | HIGH |
| 62325 | 2.094 | 0.004 | 0.324 | 0.002 | HIGH |
| 62326 | 1.739 | 0.003 | 0.344 | 0.002 | HIGH |
| 62327 | 1.352 | 0.003 | 0.298 | 0.002 | HIGH |
| 62329 | 2.755 | 0.005 | 0.627 | 0.004 | HIGH |
| 62330 | 2.341 | 0.004 | 0.431 | 0.003 | HIGH |
| 62331 | 1.746 | 0.003 | 0.022 | 0.000 | HIGH |
| 62332 | 1.700 | 0.003 | 0.669 | 0.004 | HIGH |
| 62333 | 1.236 | 0.002 | 0.191 | 0.001 | HIGH |
| 62334 | 2.399 | 0.005 | 0.375 | 0.002 | HIGH |
| 62335 | 2.146 | 0.004 | 0.245 | 0.002 | HIGH |
| 62336 | 0.865 | 0.002 | 0.014 | 0.000 | HIGH |
| 62337 | 1.856 | 0.004 | 0.339 | 0.002 | HIGH |
| 62338 | 1.501 | 0.003 | 0.163 | 0.001 | HIGH |
| 62339 | 1.316 | 0.002 | 0.131 | 0.001 | HIGH |
| 62340 | 1.270 | 0.002 | 0.143 | 0.001 | HIGH |
| 62341 | 0.753 | 0.001 | 0.112 | 0.001 | HIGH |
| 62342 | 0.886 | 0.002 | 0.089 | 0.001 | HIGH |
| 62343 | 0.353 | 0.001 | 0.029 | 0.000 | HIGH |
| 62346 | 0.606 | 0.001 | 0.064 | 0.000 | HIGH |
| 62347 | 0.028 | 0.000 | 0.060 | 0.000 | HIGH |
| 62348 | -0.404 | 0.001 | 0.191 | 0.001 | HIGH |
| 62349 | -0.572 | 0.001 | 0.065 | 0.000 | HIGH |
| 62350 | -0.795 | 0.001 | 0.048 | 0.000 | HIGH |
| 62351 | -0.698 | 0.001 | 0.031 | 0.000 | HIGH |
| 62353 | 0.596 | 0.001 | 0.225 | 0.001 | HIGH |
| 62354 | -0.007 | 0.000 | 0.168 | 0.001 | HIGH |
| 62355 | -0.407 | 0.001 | 0.432 | 0.003 | HIGH |
| 62356 | -0.831 | 0.002 | 0.332 | 0.002 | HIGH |
| 62357 | -0.999 | 0.002 | 0.111 | 0.001 | HIGH |
| 62358 | -1.218 | 0.002 | 0.067 | 0.000 | HIGH |
| 62361 | -0.215 | 0.000 | 0.132 | 0.001 | HIGH |
| 62362 | -0.489 | 0.001 | 0.477 | 0.003 | HIGH |
| 62363 | -0.564 | 0.001 | 0.135 | 0.001 | HIGH |
| 62364 | -1.166 | 0.002 | 0.229 | 0.001 | HIGH |
| 62365 | -1.424 | 0.003 | 0.204 | 0.001 | HIGH |
| 62368 | -0.090 | 0.000 | 0.107 | 0.001 | HIGH |
| 62369 | -0.405 | 0.001 | 0.101 | 0.001 | HIGH |
| 62370 | -0.668 | 0.001 | 0.171 | 0.001 | HIGH |
| 62371 | -0.846 | 0.002 | 0.193 | 0.001 | HIGH |
| 62372 | -1.217 | 0.002 | 0.308 | 0.002 | HIGH |
| 62375 | 0.842 | 0.002 | 0.034 | 0.000 | HIGH |
| 62376 | -0.044 | 0.000 | 0.032 | 0.000 | HIGH |
| 62377 | -0.716 | 0.001 | 0.073 | 0.000 | HIGH |
| 62378 | -0.960 | 0.002 | 0.088 | 0.001 | HIGH |

S.S. 206

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62379 | -0.842 | 0.002 | 0.666 | 0.004 | HIGH |
| 62383 | 2.630 | 0.005 | 0.060 | 0.000 | HIGH |
| 62384 | 0.602 | 0.001 | 0.018 | 0.000 | HIGH |
| 62385 | -0.568 | 0.001 | 0.025 | 0.000 | HIGH |
| 62386 | -1.293 | 0.002 | 0.047 | 0.000 | HIGH |
| 62387 | -1.846 | 0.003 | 0.247 | 0.002 | HIGH |
| 62390 | 3.119 | 0.006 | 0.103 | 0.001 | HIGH |
| 62391 | 0.790 | 0.001 | 0.061 | 0.000 | HIGH |
| 62392 | -0.540 | 0.001 | 0.057 | 0.000 | HIGH |
| 62393 | -1.024 | 0.002 | 0.061 | 0.000 | HIGH |
| 62394 | -2.664 | 0.005 | 0.165 | 0.001 | HIGH |
| 62396 | 2.257 | 0.004 | 0.314 | 0.002 | HIGH |
| 62397 | -0.369 | 0.001 | 0.158 | 0.001 | HIGH |
| 62398 | -1.508 | 0.003 | 0.166 | 0.001 | HIGH |
| 62399 | -2.063 | 0.004 | 0.129 | 0.001 | HIGH |
| 62400 | -2.308 | 0.004 | 0.066 | 0.000 | HIGH |
| 62401 | -2.017 | 0.004 | 0.724 | 0.005 | HIGH |
| 62402 | -5.915 | 0.011 | 0.428 | 0.003 | HIGH |
| 62403 | -4.156 | 0.008 | 0.500 | 0.003 | HIGH |
| 62404 | -3.019 | 0.006 | 0.451 | 0.003 | HIGH |
| 62405 | -2.571 | 0.005 | 0.132 | 0.001 | HIGH |
| 62406 | -11.155 | 0.021 | 1.729 | 0.011 | HIGH |
| 62407 | -5.396 | 0.010 | 0.793 | 0.005 | HIGH |
| 62408 | -4.546 | 0.009 | 1.228 | 0.008 | HIGH |
| 62409 | -1.758 | 0.003 | 0.332 | 0.002 | HIGH |
| 62410 | -8.132 | 0.015 | 2.654 | 0.017 | HIGH |
| 62411 | -3.749 | 0.007 | 2.170 | 0.014 | HIGH |
| 62412 | -5.791 | 0.011 | 1.462 | 0.009 | HIGH |
| 62413 | -2.903 | 0.005 | 4.897 | 0.031 | HIGH |
| 62414 | -1.738 | 0.003 | 1.708 | 0.011 | HIGH |
| 62415 | -2.029 | 0.004 | 1.560 | 0.010 | HIGH |
| 63301 | 3.059 | 0.006 | 0.040 | 0.000 | HIGH |
| 63302 | -2.817 | 0.005 | 0.039 | 0.000 | HIGH |
| 63303 | -2.060 | 0.004 | 0.036 | 0.000 | HIGH |
| 63304 | 3.679 | 0.007 | 0.006 | 0.000 | HIGH |
| 63305 | -0.235 | 0.000 | 0.031 | 0.000 | HIGH |
| 63306 | 0.677 | 0.001 | 0.039 | 0.000 | HIGH |
| 63307 | 0.610 | 0.001 | 0.043 | 0.000 | HIGH |
| 63308 | -0.361 | 0.001 | 0.047 | 0.000 | HIGH |
| 63313 | 2.830 | 0.005 | 0.016 | 0.000 | HIGH |
| 63314 | 3.167 | 0.006 | 0.014 | 0.000 | HIGH |
| 63319 | 0.325 | 0.001 | 0.045 | 0.000 | HIGH |
| 63320 | 0.756 | 0.001 | 0.034 | 0.000 | HIGH |
| 63321 | 3.527 | 0.007 | 0.027 | 0.000 | HIGH |
| 63322 | 3.131 | 0.006 | 0.024 | 0.000 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63323 | 1.791 | 0.003 | 0.043 | 0.000 | HIGH |
| 63324 | -0.057 | 0.000 | 0.086 | 0.001 | HIGH |
| 63327 | 1.807 | 0.003 | 0.087 | 0.001 | HIGH |
| 63328 | 0.094 | 0.000 | 0.057 | 0.000 | HIGH |
| 63329 | 0.507 | 0.001 | 0.053 | 0.000 | HIGH |
| 63330 | 1.072 | 0.002 | 0.060 | 0.000 | HIGH |
| 63331 | 2.837 | 0.005 | 0.054 | 0.000 | HIGH |
| 63332 | 2.496 | 0.005 | 0.031 | 0.000 | HIGH |
| 63333 | 2.350 | 0.004 | 0.069 | 0.000 | HIGH |
| 63334 | 1.363 | 0.003 | 0.197 | 0.001 | HIGH |
| 63338 | 1.217 | 0.002 | 0.214 | 0.001 | HIGH |
| 63339 | 0.583 | 0.001 | 0.094 | 0.001 | HIGH |
| 63340 | 0.841 | 0.002 | 0.055 | 0.000 | HIGH |
| 63341 | 1.177 | 0.002 | 0.076 | 0.000 | HIGH |
| 63342 | 2.194 | 0.004 | 0.057 | 0.000 | HIGH |
| 63343 | 1.634 | 0.003 | 0.034 | 0.000 | HIGH |
| 63344 | 1.391 | 0.003 | 0.094 | 0.001 | HIGH |
| 63345 | 1.386 | 0.003 | 0.225 | 0.001 | HIGH |
| 63350 | 0.798 | 0.002 | 0.270 | 0.002 | HIGH |
| 63351 | 0.739 | 0.001 | 0.123 | 0.001 | HIGH |
| 63352 | 0.944 | 0.002 | 0.040 | 0.000 | HIGH |
| 63353 | 1.436 | 0.003 | 0.073 | 0.000 | HIGH |
| 63354 | 1.626 | 0.003 | 0.042 | 0.000 | HIGH |
| 63355 | 1.022 | 0.002 | 0.037 | 0.000 | HIGH |
| 63356 | 0.698 | 0.001 | 0.040 | 0.000 | HIGH |
| 63357 | 0.104 | 0.000 | 0.202 | 0.001 | HIGH |
| 63363 | 0.419 | 0.001 | 0.200 | 0.001 | HIGH |
| 63364 | 0.617 | 0.001 | 0.086 | 0.001 | HIGH |
| 63365 | 1.137 | 0.002 | 0.021 | 0.000 | HIGH |
| 63366 | 2.367 | 0.004 | 0.029 | 0.000 | HIGH |
| 63367 | 1.052 | 0.002 | 0.019 | 0.000 | HIGH |
| 63368 | 0.546 | 0.001 | 0.020 | 0.000 | HIGH |
| 63369 | 0.307 | 0.001 | 0.019 | 0.000 | HIGH |
| 63370 | -0.126 | 0.000 | 0.050 | 0.000 | HIGH |
| 63371 | -1.145 | 0.002 | 0.197 | 0.001 | HIGH |
| 63376 | -0.290 | 0.001 | 0.123 | 0.001 | HIGH |
| 63377 | -0.077 | 0.000 | 0.111 | 0.001 | HIGH |
| 63378 | 0.456 | 0.001 | 0.035 | 0.000 | HIGH |
| 63379 | 1.243 | 0.002 | 0.010 | 0.000 | HIGH |
| 63380 | 3.119 | 0.006 | 0.035 | 0.000 | HIGH |
| 63381 | 0.256 | 0.000 | 0.003 | 0.000 | HIGH |
| 63382 | 0.024 | 0.000 | 0.002 | 0.000 | HIGH |
| 63383 | -0.105 | 0.000 | 0.005 | 0.000 | HIGH |
| 63384 | -0.319 | 0.001 | 0.011 | 0.000 | HIGH |
| 63385 | -0.758 | 0.001 | 0.013 | 0.000 | HIGH |

5.5.208

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63386 | -1.191 | 0.002 | 0.137 | 0.001 | HIGH |
| 63390 | -0.831 | 0.002 | 0.152 | 0.001 | HIGH |
| 63391 | -0.758 | 0.001 | 0.063 | 0.000 | HIGH |
| 63392 | -0.484 | 0.001 | 0.027 | 0.000 | HIGH |
| 63393 | -0.108 | 0.000 | 0.015 | 0.000 | HIGH |
| 63394 | 0.162 | 0.000 | 0.038 | 0.000 | HIGH |
| 63396 | 0.946 | 0.002 | 0.023 | 0.000 | HIGH |
| 63397 | 0.924 | 0.002 | 0.018 | 0.000 | HIGH |
| 63398 | 1.016 | 0.002 | 0.020 | 0.000 | HIGH |
| 63399 | 1.140 | 0.002 | 0.014 | 0.000 | HIGH |
| 63400 | 1.181 | 0.002 | 0.025 | 0.000 | HIGH |
| 63401 | 0.974 | 0.002 | 0.027 | 0.000 | HIGH |
| 63402 | 0.688 | 0.001 | 0.025 | 0.000 | HIGH |
| 63403 | -0.513 | 0.001 | 0.107 | 0.001 | HIGH |
| 63406 | 0.703 | 0.001 | 0.044 | 0.000 | HIGH |
| 63407 | 0.961 | 0.002 | 0.031 | 0.000 | HIGH |
| 63408 | 1.211 | 0.002 | 0.029 | 0.000 | HIGH |
| 63409 | 1.544 | 0.003 | 0.041 | 0.000 | HIGH |
| 63410 | 1.797 | 0.003 | 0.048 | 0.000 | HIGH |
| 63411 | 1.953 | 0.004 | 0.048 | 0.000 | HIGH |
| 63412 | 2.909 | 0.005 | 0.072 | 0.000 | HIGH |
| 63413 | 2.031 | 0.004 | 0.202 | 0.001 | HIGH |
| 63415 | 0.788 | 0.001 | 0.068 | 0.000 | HIGH |
| 63416 | 1.130 | 0.002 | 0.065 | 0.000 | HIGH |
| 63417 | 1.573 | 0.003 | 0.050 | 0.000 | HIGH |
| 63418 | 2.175 | 0.004 | 0.056 | 0.000 | HIGH |
| 63419 | 2.189 | 0.004 | 0.060 | 0.000 | HIGH |
| 63420 | 1.961 | 0.004 | 0.057 | 0.000 | HIGH |
| 63421 | 3.406 | 0.006 | 0.068 | 0.000 | HIGH |
| 63424 | 0.857 | 0.002 | 0.109 | 0.001 | HIGH |
| 63425 | 1.399 | 0.003 | 0.087 | 0.001 | HIGH |
| 63426 | 2.426 | 0.005 | 0.105 | 0.001 | HIGH |
| 63432 | 0.650 | 0.001 | 0.207 | 0.001 | HIGH |
| 63433 | 1.340 | 0.003 | 0.191 | 0.001 | HIGH |
| 63440 | -0.238 | 0.000 | 0.419 | 0.003 | HIGH |
| 63450 | -1.231 | 0.002 | 0.462 | 0.003 | HIGH |
| 63455 | 0.147 | 0.000 | 0.185 | 0.001 | HIGH |
| 63456 | 1.788 | 0.003 | 0.069 | 0.000 | HIGH |
| 63457 | 1.340 | 0.003 | 0.091 | 0.001 | HIGH |
| 63463 | 0.302 | 0.001 | 0.094 | 0.001 | HIGH |
| 63464 | 0.844 | 0.002 | 0.091 | 0.001 | HIGH |
| 63465 | 0.449 | 0.001 | 0.083 | 0.001 | HIGH |
| 63467 | 0.356 | 0.001 | 0.318 | 0.002 | HIGH |
| 63470 | 0.227 | 0.000 | 0.127 | 0.001 | HIGH |
| 63471 | 0.300 | 0.001 | 0.118 | 0.001 | HIGH |

5.5.209

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63472 | 0.058 | 0.000 | 0.064 | 0.000 | HIGH |
| 63473 | -0.348 | 0.001 | 0.079 | 0.001 | HIGH |
| 63474 | 0.640 | 0.001 | 0.472 | 0.003 | HIGH |
| 63475 | 0.381 | 0.001 | 0.086 | 0.001 | HIGH |
| 63476 | 0.185 | 0.000 | 0.096 | 0.001 | HIGH |
| 63477 | 0.004 | 0.000 | 0.097 | 0.001 | HIGH |
| 63478 | -0.184 | 0.000 | 0.043 | 0.000 | HIGH |
| 63479 | -0.362 | 0.001 | 0.123 | 0.001 | HIGH |
| 63480 | 0.845 | 0.002 | 0.353 | 0.002 | HIGH |
| 63481 | 0.665 | 0.001 | 0.135 | 0.001 | HIGH |
| 63482 | 0.153 | 0.000 | 0.112 | 0.001 | HIGH |
| 63483 | -0.347 | 0.001 | 0.069 | 0.000 | HIGH |
| 63484 | -0.619 | 0.001 | 0.136 | 0.001 | HIGH |
| 63485 | 0.902 | 0.002 | 0.176 | 0.001 | HIGH |
| 63486 | 0.696 | 0.001 | 0.149 | 0.001 | HIGH |
| 63487 | -0.068 | 0.000 | 0.123 | 0.001 | HIGH |
| 63488 | -0.948 | 0.002 | 0.134 | 0.001 | HIGH |
| 63489 | 1.255 | 0.002 | 0.161 | 0.001 | HIGH |
| 63490 | 1.229 | 0.002 | 0.161 | 0.001 | HIGH |
| 63491 | -0.295 | 0.001 | 0.135 | 0.001 | HIGH |
| 63492 | 3.899 | 0.007 | 0.151 | 0.001 | HIGH |
| 63499 | 0.812 | 0.002 | 0.048 | 0.000 | HIGH |
| 63500 | 0.214 | 0.000 | 0.017 | 0.000 | HIGH |
| 63501 | -0.294 | 0.001 | 0.021 | 0.000 | HIGH |
| 63502 | -0.583 | 0.001 | 0.018 | 0.000 | HIGH |
| 63503 | -0.964 | 0.002 | 0.006 | 0.000 | HIGH |
| 63504 | -2.032 | 0.004 | 0.005 | 0.000 | HIGH |
| 63505 | -4.016 | 0.008 | 0.231 | 0.001 | HIGH |
| 63509 | 0.254 | 0.000 | 0.030 | 0.000 | HIGH |
| 63510 | -0.175 | 0.000 | 0.039 | 0.000 | HIGH |
| 63511 | -0.421 | 0.001 | 0.039 | 0.000 | HIGH |
| 63512 | -0.615 | 0.001 | 0.029 | 0.000 | HIGH |
| 63513 | -1.122 | 0.002 | 0.037 | 0.000 | HIGH |
| 63514 | -1.893 | 0.004 | 0.076 | 0.000 | HIGH |
| 63515 | -1.960 | 0.004 | 0.098 | 0.001 | HIGH |
| 63518 | -2.036 | 0.004 | 0.061 | 0.000 | HIGH |
| 63519 | -0.918 | 0.002 | 0.054 | 0.000 | HIGH |
| 63520 | -0.427 | 0.001 | 0.057 | 0.000 | HIGH |
| 63521 | -0.358 | 0.001 | 0.048 | 0.000 | HIGH |
| 63522 | -0.544 | 0.001 | 0.070 | 0.000 | HIGH |
| 63523 | -1.062 | 0.002 | 0.080 | 0.001 | HIGH |
| 63524 | -1.283 | 0.002 | 0.081 | 0.001 | HIGH |
| 63530 | -0.101 | 0.000 | 0.090 | 0.001 | HIGH |
| 63531 | -0.300 | 0.001 | 0.154 | 0.001 | HIGH |
| 63532 | -0.468 | 0.001 | 0.175 | 0.001 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS WITHOUT SRM

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63539 | 0.629 | 0.001 | 0.239 | 0.002 | HIGH |
| 63540 | 0.492 | 0.001 | 0.279 | 0.002 | HIGH |
| 63550 | 1.608 | 0.003 | 0.740 | 0.005 | HIGH |
| 63553 | -1.697 | 0.003 | 0.084 | 0.001 | HIGH |
| 63554 | -0.256 | 0.000 | 0.170 | 0.001 | HIGH |
| 63559 | 0.536 | 0.001 | 1.182 | 0.008 | HIGH |
| 63561 | -3.643 | 0.007 | 0.057 | 0.000 | HIGH |
| 63562 | -2.652 | 0.005 | 0.085 | 0.001 | HIGH |
| 63563 | -2.494 | 0.005 | 0.092 | 0.001 | HIGH |
| 63568 | -2.858 | 0.005 | 0.038 | 0.000 | HIGH |
| 63569 | -3.119 | 0.006 | 0.034 | 0.000 | HIGH |
| 63570 | -2.959 | 0.006 | 0.089 | 0.001 | HIGH |
| 63571 | -2.937 | 0.006 | 0.093 | 0.001 | HIGH |
| 63574 | 0.881 | 0.002 | 0.321 | 0.002 | HIGH |
| 63575 | -2.354 | 0.004 | 0.042 | 0.000 | HIGH |
| 63576 | -2.512 | 0.005 | 0.033 | 0.000 | HIGH |
| 63577 | -2.254 | 0.004 | 0.058 | 0.000 | HIGH |
| 63578 | -1.647 | 0.003 | 0.060 | 0.000 | HIGH |
| 63579 | -0.616 | 0.001 | 0.050 | 0.000 | HIGH |
| 63580 | 0.277 | 0.001 | 0.250 | 0.002 | HIGH |
| 63581 | -2.121 | 0.004 | 0.043 | 0.000 | HIGH |
| 63582 | -1.993 | 0.004 | 0.036 | 0.000 | HIGH |
| 63583 | -1.653 | 0.003 | 0.042 | 0.000 | HIGH |
| 63584 | -1.204 | 0.002 | 0.047 | 0.000 | HIGH |
| 63585 | -0.648 | 0.001 | 0.181 | 0.001 | HIGH |
| 63586 | -1.827 | 0.003 | 0.043 | 0.000 | HIGH |
| 63587 | -1.573 | 0.003 | 0.026 | 0.000 | HIGH |
| 63588 | -1.317 | 0.002 | 0.029 | 0.000 | HIGH |
| 63589 | -0.977 | 0.002 | 0.119 | 0.001 | HIGH |
| 63590 | -1.521 | 0.003 | 0.048 | 0.000 | HIGH |
| 63591 | -1.277 | 0.002 | 0.011 | 0.000 | HIGH |
| 63592 | -1.027 | 0.002 | 0.052 | 0.000 | HIGH |
| 63593 | -1.237 | 0.002 | 0.049 | 0.000 | HIGH |
| 63594 | -1.036 | 0.002 | 0.033 | 0.000 | HIGH |
| 63595 | -0.917 | 0.002 | 0.032 | 0.000 | HIGH |

5.5.211

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: BOOSTER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12201 | -0.261 | 0.000 | 0.060 | 0.000 | HIGH |
| 12202 | 3.295 | 0.006 | 0.068 | 0.000 | HIGH |
| 12204 | -1.903 | 0.004 | 0.059 | 0.000 | HIGH |
| 12205 | 0.583 | 0.001 | 0.040 | 0.000 | HIGH |
| 12206 | -2.120 | 0.004 | 0.070 | 0.000 | HIGH |
| 12207 | -2.777 | 0.005 | 0.226 | 0.001 | HIGH |
| 12208 | -1.811 | 0.003 | 0.165 | 0.001 | HIGH |
| 12215 | -0.264 | 0.000 | 0.122 | 0.001 | HIGH |
| 12216 | 0.227 | 0.000 | 0.107 | 0.001 | HIGH |
| 12222 | -2.222 | 0.004 | 0.167 | 0.001 | HIGH |
| 12223 | -2.910 | 0.005 | 0.205 | 0.001 | HIGH |
| 12224 | 0.781 | 0.001 | 0.194 | 0.001 | HIGH |
| 12225 | 0.687 | 0.001 | 0.146 | 0.001 | HIGH |
| 12226 | 0.947 | 0.002 | 0.037 | 0.000 | HIGH |
| 12227 | 2.809 | 0.005 | 1.242 | 0.008 | HIGH |
| 12228 | 5.128 | 0.010 | 1.584 | 0.010 | HIGH |
| 12229 | -5.365 | 0.010 | 2.483 | 0.016 | HIGH |
| 12230 | -3.042 | 0.006 | 0.421 | 0.003 | HIGH |
| 12231 | -2.782 | 0.005 | 0.220 | 0.001 | HIGH |
| 12232 | -3.899 | 0.007 | 0.137 | 0.001 | HIGH |
| 12233 | -3.965 | 0.007 | 0.984 | 0.006 | HIGH |
| 12234 | 1.031 | 0.002 | 0.095 | 0.001 | HIGH |
| 12235 | 1.042 | 0.002 | 0.168 | 0.001 | HIGH |
| 12236 | 2.430 | 0.005 | 0.009 | 0.000 | HIGH |
| 12237 | 3.180 | 0.006 | 0.035 | 0.000 | HIGH |
| 12238 | 7.115 | 0.013 | 0.917 | 0.006 | HIGH |
| 12239 | 20.335 | 0.038 | 1.037 | 0.007 | HIGH |
| 12240 | -5.067 | 0.010 | 9.220 | 0.059 | HIGH |
| 12241 | -5.298 | 0.010 | 10.254 | 0.065 | HIGH |
| 12242 | -4.774 | 0.009 | 5.717 | 0.037 | HIGH |
| 12243 | -4.876 | 0.009 | 1.199 | 0.008 | HIGH |
| 12244 | -4.423 | 0.008 | 0.963 | 0.006 | HIGH |
| 12245 | 0.749 | 0.001 | 0.047 | 0.000 | HIGH |
| 12246 | 0.868 | 0.002 | 0.125 | 0.001 | HIGH |
| 12247 | 2.293 | 0.004 | 0.040 | 0.000 | HIGH |
| 12248 | 3.324 | 0.006 | 0.010 | 0.000 | HIGH |
| 12249 | 8.327 | 0.016 | 0.785 | 0.005 | HIGH |
| 12250 | 13.465 | 0.025 | 4.687 | 0.030 | HIGH |
| 12251 | -7.439 | 0.014 | 44.419 | 0.284 | 7.05 |
| 12252 | -1.345 | 0.003 | 0.112 | 0.001 | HIGH |
| 12253 | -10.509 | 0.020 | 37.596 | 0.240 | 8.79 |
| 12254 | -6.399 | 0.012 | 3.505 | 0.022 | HIGH |
| 12255 | -4.749 | 0.009 | 2.612 | 0.017 | HIGH |
| 12256 | -3.816 | 0.007 | 1.410 | 0.009 | HIGH |
| 12257 | 0.470 | 0.001 | 0.058 | 0.000 | HIGH |

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5.5.213

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12258 | 0.489 | 0.001 | 0.063 | 0.000 | HIGH |
| 12259 | 0.707 | 0.001 | 0.141 | 0.001 | HIGH |
| 12260 | 1.730 | 0.003 | 0.041 | 0.000 | HIGH |
| 12261 | 4.657 | 0.009 | 0.385 | 0.002 | HIGH |
| 12262 | 6.791 | 0.013 | 1.426 | 0.009 | HIGH |
| 12263 | 15.819 | 0.030 | 3.153 | 0.020 | HIGH |
| 12264 | -3.438 | 0.006 | 20.111 | 0.128 | HIGH |
| 12265 | -4.489 | 0.008 | 16.637 | 0.106 | HIGH |
| 12266 | -4.444 | 0.008 | 5.707 | 0.036 | HIGH |
| 12267 | -3.597 | 0.007 | 1.485 | 0.009 | HIGH |
| 12268 | -2.852 | 0.005 | 1.366 | 0.009 | HIGH |
| 12269 | -2.403 | 0.005 | 0.577 | 0.004 | HIGH |
| 12270 | -0.289 | 0.001 | 0.066 | 0.000 | HIGH |
| 12271 | -0.345 | 0.001 | 0.025 | 0.000 | HIGH |
| 12272 | -0.542 | 0.001 | 0.016 | 0.000 | HIGH |
| 12273 | -0.787 | 0.001 | 0.006 | 0.000 | HIGH |
| 12274 | -0.698 | 0.001 | 0.015 | 0.000 | HIGH |
| 12275 | 2.972 | 0.006 | 0.010 | 0.000 | HIGH |
| 12278 | -0.450 | 0.001 | 0.232 | 0.001 | HIGH |
| 12279 | -0.646 | 0.001 | 0.039 | 0.000 | HIGH |
| 12280 | -0.083 | 0.000 | 0.020 | 0.000 | HIGH |
| 12281 | -2.004 | 0.004 | 0.017 | 0.000 | HIGH |
| 12282 | -1.746 | 0.003 | 0.039 | 0.000 | HIGH |
| 12283 | 0.634 | 0.001 | 0.225 | 0.001 | HIGH |
| 12286 | -0.545 | 0.001 | 0.221 | 0.001 | HIGH |
| 12287 | -1.000 | 0.002 | 0.026 | 0.000 | HIGH |
| 12288 | -1.779 | 0.003 | 0.010 | 0.000 | HIGH |
| 12289 | -2.859 | 0.005 | 0.011 | 0.000 | HIGH |
| 12290 | -4.314 | 0.008 | 0.053 | 0.000 | HIGH |
| 12293 | -0.499 | 0.001 | 0.207 | 0.001 | HIGH |
| 12294 | -0.896 | 0.002 | 0.043 | 0.000 | HIGH |
| 12295 | -0.437 | 0.001 | 0.011 | 0.000 | HIGH |
| 12296 | -5.542 | 0.010 | 0.226 | 0.001 | HIGH |
| 12297 | -9.991 | 0.019 | 0.449 | 0.003 | HIGH |
| 12300 | 2.106 | 0.004 | 0.266 | 0.002 | HIGH |
| 12301 | -0.601 | 0.001 | 0.571 | 0.004 | HIGH |
| 12302 | -5.248 | 0.010 | 1.052 | 0.007 | HIGH |
| 12303 | -6.688 | 0.013 | 1.493 | 0.010 | HIGH |
| 12304 | -8.763 | 0.017 | 2.000 | 0.013 | HIGH |
| 12308 | 0.367 | 0.001 | 1.157 | 0.007 | HIGH |
| 12309 | 0.056 | 0.000 | 1.447 | 0.009 | HIGH |
| 12310 | -7.687 | 0.015 | 4.844 | 0.031 | HIGH |
| 12311 | -8.376 | 0.016 | 3.453 | 0.022 | HIGH |
| 12312 | -7.569 | 0.014 | 0.246 | 0.002 | HIGH |
| 12316 | 2.739 | 0.005 | 2.014 | 0.013 | HIGH |

412.5-5

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12317 | 1.348 | 0.003 | 27.320 | 0.174 | HIGH |
| 12318 | -6.889 | 0.013 | 12.666 | 0.081 | HIGH |
| 12319 | -6.648 | 0.013 | 12.041 | 0.077 | HIGH |
| 12320 | -5.177 | 0.010 | 0.201 | 0.001 | HIGH |
| 12323 | 6.375 | 0.012 | 19.859 | 0.127 | HIGH |
| 12324 | 0.568 | 0.001 | 0.157 | 0.001 | HIGH |
| 12325 | -5.562 | 0.010 | 36.437 | 0.233 | HIGH |
| 12326 | -6.041 | 0.011 | 14.342 | 0.092 | HIGH |
| 12327 | -1.614 | 0.003 | 0.069 | 0.000 | HIGH |
| 12329 | 1.251 | 0.002 | 15.295 | 0.098 | HIGH |
| 12330 | 1.141 | 0.002 | 13.566 | 0.087 | HIGH |
| 12331 | -2.915 | 0.005 | 8.729 | 0.056 | HIGH |
| 12332 | -2.780 | 0.005 | 5.353 | 0.034 | HIGH |
| 12333 | -1.640 | 0.003 | 0.568 | 0.004 | HIGH |
| 12334 | 1.495 | 0.003 | 9.978 | 0.064 | HIGH |
| 12335 | 0.583 | 0.001 | 5.228 | 0.033 | HIGH |
| 12336 | -1.040 | 0.002 | 2.261 | 0.014 | HIGH |
| 12337 | -1.480 | 0.003 | 2.241 | 0.014 | HIGH |
| 12338 | 1.575 | 0.003 | 3.137 | 0.020 | HIGH |
| 12339 | 0.761 | 0.001 | 1.964 | 0.013 | HIGH |
| 12340 | -0.136 | 0.000 | 0.967 | 0.006 | HIGH |
| 12341 | 1.343 | 0.003 | 0.521 | 0.003 | HIGH |
| 12342 | 0.898 | 0.002 | 0.533 | 0.003 | HIGH |
| 12343 | 0.857 | 0.002 | 0.073 | 0.000 | HIGH |
| 12346 | 0.870 | 0.002 | 0.118 | 0.001 | HIGH |
| 12347 | 1.452 | 0.003 | 0.146 | 0.001 | HIGH |
| 12348 | 1.557 | 0.003 | 2.607 | 0.017 | HIGH |
| 12349 | 1.026 | 0.002 | 1.844 | 0.012 | HIGH |
| 12350 | 0.089 | 0.000 | 0.728 | 0.005 | HIGH |
| 12351 | -0.310 | 0.001 | 0.769 | 0.005 | HIGH |
| 12353 | 0.144 | 0.000 | 0.069 | 0.000 | HIGH |
| 12354 | 3.221 | 0.006 | 0.117 | 0.001 | HIGH |
| 12355 | 1.421 | 0.003 | 10.788 | 0.069 | HIGH |
| 12356 | 1.519 | 0.003 | 5.470 | 0.035 | HIGH |
| 12357 | -0.103 | 0.000 | 2.330 | 0.015 | HIGH |
| 12358 | -0.788 | 0.001 | 2.261 | 0.014 | HIGH |
| 12361 | 5.379 | 0.010 | 0.144 | 0.001 | HIGH |
| 12362 | 3.989 | 0.008 | 16.124 | 0.103 | HIGH |
| 12363 | 3.430 | 0.006 | 12.985 | 0.083 | HIGH |
| 12364 | -0.630 | 0.001 | 8.102 | 0.052 | HIGH |
| 12365 | -1.419 | 0.003 | 5.565 | 0.036 | HIGH |
| 12368 | 10.266 | 0.019 | 0.368 | 0.002 | HIGH |
| 12369 | 6.985 | 0.013 | 8.875 | 0.057 | HIGH |
| 12370 | 7.227 | 0.014 | 15.074 | 0.096 | HIGH |
| 12371 | -3.325 | 0.006 | 19.932 | 0.127 | HIGH |

55.55.215

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12372 | -3.240 | 0.006 | 13.817 | 0.088 | HIGH |
| 12375 | 13.684 | 0.026 | 1.155 | 0.007 | HIGH |
| 12376 | 5.258 | 0.010 | 2.096 | 0.013 | HIGH |
| 12377 | 4.553 | 0.009 | 15.769 | 0.101 | HIGH |
| 12378 | -0.872 | 0.002 | 0.106 | 0.001 | HIGH |
| 12379 | -3.098 | 0.006 | 16.539 | 0.106 | HIGH |
| 12383 | 14.104 | 0.027 | 0.478 | 0.003 | HIGH |
| 12384 | 10.834 | 0.020 | 0.135 | 0.001 | HIGH |
| 12385 | 9.608 | 0.018 | 1.757 | 0.011 | HIGH |
| 12386 | -2.251 | 0.004 | 2.116 | 0.014 | HIGH |
| 12387 | -1.947 | 0.004 | 7.981 | 0.051 | HIGH |
| 12390 | 7.254 | 0.014 | 0.049 | 0.000 | HIGH |
| 12391 | 5.772 | 0.011 | 0.040 | 0.000 | HIGH |
| 12392 | 7.264 | 0.014 | 0.243 | 0.002 | HIGH |
| 12393 | 1.385 | 0.003 | 0.448 | 0.003 | HIGH |
| 12394 | 0.805 | 0.002 | 0.694 | 0.004 | HIGH |
| 12396 | 4.613 | 0.009 | 0.062 | 0.000 | HIGH |
| 12397 | 5.695 | 0.011 | 0.029 | 0.000 | HIGH |
| 12398 | 5.232 | 0.010 | 0.026 | 0.000 | HIGH |
| 12399 | -0.423 | 0.001 | 0.357 | 0.002 | HIGH |
| 12400 | -2.649 | 0.005 | 0.637 | 0.004 | HIGH |
| 12401 | 3.437 | 0.006 | 0.106 | 0.001 | HIGH |
| 12402 | 3.074 | 0.006 | 0.102 | 0.001 | HIGH |
| 12403 | 3.966 | 0.007 | 0.019 | 0.000 | HIGH |
| 12404 | 2.808 | 0.005 | 0.046 | 0.000 | HIGH |
| 12405 | -1.333 | 0.003 | 0.600 | 0.004 | HIGH |
| 12406 | 2.536 | 0.005 | 0.186 | 0.001 | HIGH |
| 12407 | 2.461 | 0.005 | 0.098 | 0.001 | HIGH |
| 12408 | 1.805 | 0.003 | 0.035 | 0.000 | HIGH |
| 12409 | 1.549 | 0.003 | 0.217 | 0.001 | HIGH |
| 12410 | 1.622 | 0.003 | 0.112 | 0.001 | HIGH |
| 12411 | 1.481 | 0.003 | 0.028 | 0.000 | HIGH |
| 12412 | 1.306 | 0.002 | 0.088 | 0.001 | HIGH |
| 12413 | 0.815 | 0.002 | 0.022 | 0.000 | HIGH |
| 12414 | 0.747 | 0.001 | 0.167 | 0.001 | HIGH |
| 12415 | 0.210 | 0.000 | 0.115 | 0.001 | HIGH |
| 12425 | -1.031 | 0.002 | 0.126 | 0.001 | HIGH |
| 12426 | 6.192 | 0.012 | 0.034 | 0.000 | HIGH |
| 12427 | 1.239 | 0.002 | 0.024 | 0.000 | HIGH |
| 12443 | 1.974 | 0.004 | 0.070 | 0.000 | HIGH |
| 12444 | 2.366 | 0.004 | 0.073 | 0.000 | HIGH |
| 12445 | 2.328 | 0.004 | 0.078 | 0.000 | HIGH |
| 12446 | 1.509 | 0.003 | 0.161 | 0.001 | HIGH |
| 12447 | 0.286 | 0.001 | 0.739 | 0.005 | HIGH |
| 12455 | -11.099 | 0.021 | 3.378 | 0.022 | HIGH |

912-5-216

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 12456 | -17.557 | 0.033 | 4.893 | 0.031 | HIGH |
| 12463 | 5.029 | 0.009 | 0.227 | 0.001 | HIGH |
| 12464 | -2.872 | 0.005 | 0.030 | 0.000 | HIGH |
| 12465 | 4.470 | 0.008 | 0.100 | 0.001 | HIGH |
| 13301 | -0.985 | 0.002 | 0.029 | 0.000 | HIGH |
| 13302 | 1.916 | 0.004 | 0.012 | 0.000 | HIGH |
| 13303 | 2.081 | 0.004 | 0.027 | 0.000 | HIGH |
| 13304 | -2.671 | 0.005 | 0.022 | 0.000 | HIGH |
| 13305 | 0.230 | 0.000 | 0.019 | 0.000 | HIGH |
| 13306 | -1.056 | 0.002 | 0.015 | 0.000 | HIGH |
| 13307 | -0.861 | 0.002 | 0.099 | 0.001 | HIGH |
| 13308 | -0.400 | 0.001 | 0.048 | 0.000 | HIGH |
| 13313 | -1.391 | 0.003 | 0.031 | 0.000 | HIGH |
| 13314 | -1.845 | 0.003 | 0.018 | 0.000 | HIGH |
| 13319 | -0.317 | 0.001 | 0.017 | 0.000 | HIGH |
| 13320 | -0.542 | 0.001 | 0.067 | 0.000 | HIGH |
| 13321 | -2.154 | 0.004 | 0.024 | 0.000 | HIGH |
| 13322 | -2.143 | 0.004 | 0.015 | 0.000 | HIGH |
| 13323 | -1.732 | 0.003 | 0.014 | 0.000 | HIGH |
| 13324 | -1.273 | 0.002 | 0.012 | 0.000 | HIGH |
| 13325 | -0.681 | 0.001 | 0.043 | 0.000 | HIGH |
| 13326 | -0.057 | 0.000 | 0.037 | 0.000 | HIGH |
| 13327 | 0.023 | 0.000 | 0.007 | 0.000 | HIGH |
| 13328 | 0.016 | 0.000 | 0.008 | 0.000 | HIGH |
| 13329 | -0.282 | 0.001 | 0.029 | 0.000 | HIGH |
| 13330 | -0.381 | 0.001 | 0.041 | 0.000 | HIGH |
| 13331 | -2.202 | 0.004 | 0.019 | 0.000 | HIGH |
| 13332 | -1.794 | 0.003 | 0.019 | 0.000 | HIGH |
| 13333 | -1.647 | 0.003 | 0.007 | 0.000 | HIGH |
| 13334 | -1.108 | 0.002 | 0.008 | 0.000 | HIGH |
| 13335 | -0.647 | 0.001 | 0.020 | 0.000 | HIGH |
| 13336 | -0.243 | 0.000 | 0.032 | 0.000 | HIGH |
| 13337 | -0.084 | 0.000 | 0.019 | 0.000 | HIGH |
| 13338 | -0.078 | 0.000 | 0.011 | 0.000 | HIGH |
| 13339 | -0.157 | 0.000 | 0.022 | 0.000 | HIGH |
| 13340 | -0.350 | 0.001 | 0.037 | 0.000 | HIGH |
| 13341 | -0.015 | 0.000 | 0.034 | 0.000 | HIGH |
| 13342 | -2.422 | 0.005 | 0.019 | 0.000 | HIGH |
| 13343 | -1.756 | 0.003 | 0.021 | 0.000 | HIGH |
| 13344 | -1.553 | 0.003 | 0.011 | 0.000 | HIGH |
| 13345 | -1.132 | 0.002 | 0.002 | 0.000 | HIGH |
| 13346 | -0.637 | 0.001 | 0.013 | 0.000 | HIGH |
| 13347 | -0.280 | 0.001 | 0.025 | 0.000 | HIGH |
| 13348 | -0.138 | 0.000 | 0.025 | 0.000 | HIGH |
| 13349 | -0.085 | 0.000 | 0.009 | 0.000 | HIGH |

5.5.218

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13350 | -0.160 | 0.000 | 0.021 | 0.000 | HIGH |
| 13351 | -0.144 | 0.000 | 0.028 | 0.000 | HIGH |
| 13352 | -0.055 | 0.000 | 0.032 | 0.000 | HIGH |
| 13353 | 0.459 | 0.001 | 0.028 | 0.000 | HIGH |
| 13354 | -3.367 | 0.006 | 0.028 | 0.000 | HIGH |
| 13355 | -2.135 | 0.004 | 0.028 | 0.000 | HIGH |
| 13356 | -1.643 | 0.003 | 0.012 | 0.000 | HIGH |
| 13357 | -1.159 | 0.002 | 0.005 | 0.000 | HIGH |
| 13358 | -0.670 | 0.001 | 0.012 | 0.000 | HIGH |
| 13359 | -0.255 | 0.000 | 0.019 | 0.000 | HIGH |
| 13360 | -0.063 | 0.000 | 0.020 | 0.000 | HIGH |
| 13361 | -0.099 | 0.000 | 0.013 | 0.000 | HIGH |
| 13362 | -0.172 | 0.000 | 0.020 | 0.000 | HIGH |
| 13363 | -0.114 | 0.000 | 0.024 | 0.000 | HIGH |
| 13364 | 0.166 | 0.000 | 0.024 | 0.000 | HIGH |
| 13365 | 0.578 | 0.001 | 0.026 | 0.000 | HIGH |
| 13366 | 1.481 | 0.003 | 0.024 | 0.000 | HIGH |
| 13367 | -4.198 | 0.008 | 0.164 | 0.001 | HIGH |
| 13368 | -2.692 | 0.005 | 0.036 | 0.000 | HIGH |
| 13369 | -1.782 | 0.003 | 0.006 | 0.000 | HIGH |
| 13370 | -1.148 | 0.002 | 0.003 | 0.000 | HIGH |
| 13371 | -0.673 | 0.001 | 0.008 | 0.000 | HIGH |
| 13372 | -0.244 | 0.000 | 0.017 | 0.000 | HIGH |
| 13373 | 0.061 | 0.000 | 0.018 | 0.000 | HIGH |
| 13374 | 0.070 | 0.000 | 0.018 | 0.000 | HIGH |
| 13375 | -0.199 | 0.000 | 0.019 | 0.000 | HIGH |
| 13376 | -0.219 | 0.000 | 0.025 | 0.000 | HIGH |
| 13377 | 0.091 | 0.000 | 0.025 | 0.000 | HIGH |
| 13378 | 0.690 | 0.001 | 0.016 | 0.000 | HIGH |
| 13379 | 1.385 | 0.003 | 0.024 | 0.000 | HIGH |
| 13380 | 2.418 | 0.005 | 0.050 | 0.000 | HIGH |
| 13382 | -2.586 | 0.005 | 0.098 | 0.001 | HIGH |
| 13383 | -1.486 | 0.003 | 0.004 | 0.000 | HIGH |
| 13384 | -0.811 | 0.002 | 0.001 | 0.000 | HIGH |
| 13385 | -0.489 | 0.001 | 0.002 | 0.000 | HIGH |
| 13386 | -0.229 | 0.000 | 0.008 | 0.000 | HIGH |
| 13387 | 0.083 | 0.000 | 0.015 | 0.000 | HIGH |
| 13388 | 0.247 | 0.000 | 0.020 | 0.000 | HIGH |
| 13389 | 0.023 | 0.000 | 0.011 | 0.000 | HIGH |
| 13390 | -0.275 | 0.001 | 0.027 | 0.000 | HIGH |
| 13391 | -0.131 | 0.000 | 0.023 | 0.000 | HIGH |
| 13392 | 0.397 | 0.001 | 0.014 | 0.000 | HIGH |
| 13393 | 1.143 | 0.002 | 0.007 | 0.000 | HIGH |
| 13394 | 1.961 | 0.004 | 0.044 | 0.000 | HIGH |
| 13397 | 1.208 | 0.002 | 0.116 | 0.001 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13398 | -0.124 | 0.000 | 0.023 | 0.000 | HIGH |
| 13399 | -0.753 | 0.001 | 0.001 | 0.000 | HIGH |
| 13400 | -0.765 | 0.001 | 0.004 | 0.000 | HIGH |
| 13401 | -0.513 | 0.001 | 0.005 | 0.000 | HIGH |
| 13402 | 0.116 | 0.000 | 0.010 | 0.000 | HIGH |
| 13403 | 1.636 | 0.003 | 0.042 | 0.000 | HIGH |
| 13406 | 1.288 | 0.002 | 0.064 | 0.000 | HIGH |
| 13407 | 0.299 | 0.001 | 0.046 | 0.000 | HIGH |
| 13408 | -0.594 | 0.001 | 0.019 | 0.000 | HIGH |
| 13409 | -1.072 | 0.002 | 0.009 | 0.000 | HIGH |
| 13410 | -1.263 | 0.002 | 0.008 | 0.000 | HIGH |
| 13411 | -1.400 | 0.003 | 0.009 | 0.000 | HIGH |
| 13412 | -1.481 | 0.003 | 0.044 | 0.000 | HIGH |
| 13413 | 0.203 | 0.000 | 0.124 | 0.001 | HIGH |
| 13415 | 0.152 | 0.000 | 0.037 | 0.000 | HIGH |
| 13416 | -0.531 | 0.001 | 0.033 | 0.000 | HIGH |
| 13417 | -1.148 | 0.002 | 0.022 | 0.000 | HIGH |
| 13418 | -1.619 | 0.003 | 0.014 | 0.000 | HIGH |
| 13419 | -2.027 | 0.004 | 0.010 | 0.000 | HIGH |
| 13420 | -2.552 | 0.005 | 0.007 | 0.000 | HIGH |
| 13421 | -2.677 | 0.005 | 0.016 | 0.000 | HIGH |
| 13424 | -0.870 | 0.002 | 0.031 | 0.000 | HIGH |
| 13425 | -1.290 | 0.002 | 0.030 | 0.000 | HIGH |
| 13426 | -1.749 | 0.003 | 0.023 | 0.000 | HIGH |
| 13427 | -2.222 | 0.004 | 0.013 | 0.000 | HIGH |
| 13428 | -2.702 | 0.005 | 0.005 | 0.000 | HIGH |
| 13429 | -3.149 | 0.006 | 0.016 | 0.000 | HIGH |
| 13430 | -3.531 | 0.007 | 0.031 | 0.000 | HIGH |
| 13432 | -1.460 | 0.003 | 0.034 | 0.000 | HIGH |
| 13433 | -1.858 | 0.004 | 0.033 | 0.000 | HIGH |
| 13434 | -2.271 | 0.004 | 0.021 | 0.000 | HIGH |
| 13435 | -2.669 | 0.005 | 0.007 | 0.000 | HIGH |
| 13436 | -3.012 | 0.006 | 0.005 | 0.000 | HIGH |
| 13437 | -3.402 | 0.006 | 0.093 | 0.001 | HIGH |
| 13438 | -3.260 | 0.006 | 0.015 | 0.000 | HIGH |
| 13440 | -1.858 | 0.004 | 0.043 | 0.000 | HIGH |
| 13441 | -2.319 | 0.004 | 0.039 | 0.000 | HIGH |
| 13442 | -2.607 | 0.005 | 0.015 | 0.000 | HIGH |
| 13443 | -2.783 | 0.005 | 0.002 | 0.000 | HIGH |
| 13444 | -2.910 | 0.005 | 0.021 | 0.000 | HIGH |
| 13445 | -3.046 | 0.006 | 0.032 | 0.000 | HIGH |
| 13446 | -2.979 | 0.006 | 0.004 | 0.000 | HIGH |
| 13450 | -2.266 | 0.004 | 0.077 | 0.000 | HIGH |
| 13451 | -2.610 | 0.005 | 0.036 | 0.000 | HIGH |
| 13452 | -2.602 | 0.005 | 0.007 | 0.000 | HIGH |

5.5.2.19

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13453 | -2.552 | 0.005 | 0.006 | 0.000 | HIGH |
| 13454 | -2.543 | 0.005 | 0.009 | 0.000 | HIGH |
| 13455 | -2.546 | 0.005 | 0.007 | 0.000 | HIGH |
| 13456 | -2.421 | 0.005 | 0.011 | 0.000 | HIGH |
| 13457 | -1.842 | 0.003 | 0.027 | 0.000 | HIGH |
| 13459 | -2.354 | 0.004 | 0.103 | 0.001 | HIGH |
| 13460 | -2.372 | 0.004 | 0.014 | 0.000 | HIGH |
| 13461 | -2.121 | 0.004 | 0.012 | 0.000 | HIGH |
| 13462 | -2.067 | 0.004 | 0.009 | 0.000 | HIGH |
| 13463 | -2.007 | 0.004 | 0.001 | 0.000 | HIGH |
| 13464 | -1.914 | 0.004 | 0.003 | 0.000 | HIGH |
| 13465 | -1.585 | 0.003 | 0.008 | 0.000 | HIGH |
| 13467 | -1.549 | 0.003 | 0.036 | 0.000 | HIGH |
| 13468 | -1.493 | 0.003 | 0.024 | 0.000 | HIGH |
| 13469 | -1.405 | 0.003 | 0.021 | 0.000 | HIGH |
| 13470 | -1.445 | 0.003 | 0.010 | 0.000 | HIGH |
| 13471 | -1.445 | 0.003 | 0.004 | 0.000 | HIGH |
| 13472 | -1.238 | 0.002 | 0.002 | 0.000 | HIGH |
| 13473 | -1.082 | 0.002 | 0.039 | 0.000 | HIGH |
| 13474 | -0.217 | 0.000 | 0.076 | 0.000 | HIGH |
| 13475 | -0.485 | 0.001 | 0.046 | 0.000 | HIGH |
| 13476 | -0.775 | 0.001 | 0.024 | 0.000 | HIGH |
| 13477 | -1.036 | 0.002 | 0.014 | 0.000 | HIGH |
| 13478 | -1.108 | 0.002 | 0.007 | 0.000 | HIGH |
| 13479 | -1.275 | 0.002 | 0.029 | 0.000 | HIGH |
| 13480 | 0.556 | 0.001 | 0.120 | 0.001 | HIGH |
| 13481 | 0.047 | 0.000 | 0.049 | 0.000 | HIGH |
| 13482 | -0.530 | 0.001 | 0.030 | 0.000 | HIGH |
| 13483 | -0.923 | 0.002 | 0.022 | 0.000 | HIGH |
| 13484 | -1.228 | 0.002 | 0.020 | 0.000 | HIGH |
| 13485 | 0.699 | 0.001 | 0.091 | 0.001 | HIGH |
| 13486 | 0.086 | 0.000 | 0.046 | 0.000 | HIGH |
| 13487 | -0.587 | 0.001 | 0.049 | 0.000 | HIGH |
| 13488 | -1.190 | 0.002 | 0.028 | 0.000 | HIGH |
| 13489 | 0.821 | 0.002 | 0.044 | 0.000 | HIGH |
| 13490 | 0.210 | 0.000 | 0.084 | 0.001 | HIGH |
| 13491 | -0.512 | 0.001 | 0.079 | 0.001 | HIGH |
| 13492 | 2.760 | 0.005 | 0.079 | 0.001 | HIGH |
| 13499 | -1.637 | 0.003 | 0.116 | 0.001 | HIGH |
| 13500 | -0.700 | 0.001 | 0.010 | 0.000 | HIGH |
| 13501 | -0.256 | 0.000 | 0.007 | 0.000 | HIGH |
| 13502 | -0.175 | 0.000 | 0.009 | 0.000 | HIGH |
| 13503 | -0.314 | 0.001 | 0.009 | 0.000 | HIGH |
| 13504 | -0.914 | 0.002 | 0.014 | 0.000 | HIGH |
| 13505 | -1.936 | 0.004 | 0.117 | 0.001 | HIGH |

5.5.220

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13509 | -0.490 | 0.001 | 0.033 | 0.000 | HIGH |
| 13510 | -0.079 | 0.000 | 0.013 | 0.000 | HIGH |
| 13511 | 0.123 | 0.000 | 0.012 | 0.000 | HIGH |
| 13512 | 0.045 | 0.000 | 0.020 | 0.000 | HIGH |
| 13513 | -0.354 | 0.001 | 0.029 | 0.000 | HIGH |
| 13514 | -1.034 | 0.002 | 0.040 | 0.000 | HIGH |
| 13515 | -1.695 | 0.003 | 0.055 | 0.000 | HIGH |
| 13518 | 0.254 | 0.000 | 0.060 | 0.000 | HIGH |
| 13519 | 0.466 | 0.001 | 0.032 | 0.000 | HIGH |
| 13520 | 0.555 | 0.001 | 0.010 | 0.000 | HIGH |
| 13521 | 0.551 | 0.001 | 0.024 | 0.000 | HIGH |
| 13522 | 0.285 | 0.001 | 0.043 | 0.000 | HIGH |
| 13523 | -0.298 | 0.001 | 0.050 | 0.000 | HIGH |
| 13524 | -0.929 | 0.002 | 0.055 | 0.000 | HIGH |
| 13526 | 1.084 | 0.002 | 0.060 | 0.000 | HIGH |
| 13527 | 1.083 | 0.002 | 0.052 | 0.000 | HIGH |
| 13528 | 1.079 | 0.002 | 0.024 | 0.000 | HIGH |
| 13529 | 1.104 | 0.002 | 0.017 | 0.000 | HIGH |
| 13530 | 1.060 | 0.002 | 0.044 | 0.000 | HIGH |
| 13531 | 0.766 | 0.001 | 0.072 | 0.000 | HIGH |
| 13532 | 0.291 | 0.001 | 0.077 | 0.000 | HIGH |
| 13534 | 1.759 | 0.003 | 0.015 | 0.000 | HIGH |
| 13535 | 1.685 | 0.003 | 0.106 | 0.001 | HIGH |
| 13536 | 1.549 | 0.003 | 0.032 | 0.000 | HIGH |
| 13537 | 1.533 | 0.003 | 0.013 | 0.000 | HIGH |
| 13538 | 1.699 | 0.003 | 0.032 | 0.000 | HIGH |
| 13539 | 1.758 | 0.003 | 0.080 | 0.001 | HIGH |
| 13540 | 1.549 | 0.003 | 0.133 | 0.001 | HIGH |
| 13544 | 2.541 | 0.005 | 0.069 | 0.000 | HIGH |
| 13545 | 2.387 | 0.005 | 0.056 | 0.000 | HIGH |
| 13546 | 1.997 | 0.004 | 0.044 | 0.000 | HIGH |
| 13547 | 1.870 | 0.004 | 0.023 | 0.000 | HIGH |
| 13548 | 1.920 | 0.004 | 0.014 | 0.000 | HIGH |
| 13549 | 2.137 | 0.004 | 0.058 | 0.000 | HIGH |
| 13550 | 2.223 | 0.004 | 0.172 | 0.001 | HIGH |
| 13553 | 3.004 | 0.006 | 0.054 | 0.000 | HIGH |
| 13554 | 2.861 | 0.005 | 0.026 | 0.000 | HIGH |
| 13555 | 2.416 | 0.005 | 0.030 | 0.000 | HIGH |
| 13556 | 2.075 | 0.004 | 0.029 | 0.000 | HIGH |
| 13557 | 1.899 | 0.004 | 0.016 | 0.000 | HIGH |
| 13558 | 1.907 | 0.004 | 0.023 | 0.000 | HIGH |
| 13559 | 1.865 | 0.004 | 0.104 | 0.001 | HIGH |
| 13561 | 3.439 | 0.006 | 0.023 | 0.000 | HIGH |
| 13562 | 3.281 | 0.006 | 0.019 | 0.000 | HIGH |
| 13563 | 2.759 | 0.005 | 0.023 | 0.000 | HIGH |

S.S.22

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 13564 | 2.283 | 0.004 | 0.023 | 0.000 | HIGH |
| 13565 | 1.886 | 0.004 | 0.021 | 0.000 | HIGH |
| 13566 | 1.600 | 0.003 | 0.012 | 0.000 | HIGH |
| 13567 | 1.206 | 0.002 | 0.003 | 0.000 | HIGH |
| 13568 | 2.485 | 0.005 | 0.013 | 0.000 | HIGH |
| 13569 | 2.843 | 0.006 | 0.013 | 0.000 | HIGH |
| 13570 | 2.812 | 0.005 | 0.014 | 0.000 | HIGH |
| 13571 | 2.408 | 0.005 | 0.022 | 0.000 | HIGH |
| 13572 | 1.939 | 0.004 | 0.022 | 0.000 | HIGH |
| 13573 | 1.529 | 0.003 | 0.020 | 0.000 | HIGH |
| 13574 | 1.032 | 0.002 | 0.037 | 0.000 | HIGH |
| 13575 | 2.517 | 0.005 | 0.003 | 0.000 | HIGH |
| 13576 | 2.608 | 0.005 | 0.011 | 0.000 | HIGH |
| 13577 | 2.422 | 0.005 | 0.023 | 0.000 | HIGH |
| 13578 | 1.957 | 0.004 | 0.025 | 0.000 | HIGH |
| 13579 | 1.503 | 0.003 | 0.026 | 0.000 | HIGH |
| 13580 | 1.091 | 0.002 | 0.036 | 0.000 | HIGH |
| 13581 | 2.526 | 0.005 | 0.010 | 0.000 | HIGH |
| 13582 | 2.396 | 0.005 | 0.028 | 0.000 | HIGH |
| 13583 | 1.924 | 0.004 | 0.032 | 0.000 | HIGH |
| 13584 | 1.313 | 0.002 | 0.031 | 0.000 | HIGH |
| 13585 | 0.900 | 0.002 | 0.033 | 0.000 | HIGH |
| 13586 | 2.495 | 0.005 | 0.031 | 0.000 | HIGH |
| 13587 | 1.891 | 0.004 | 0.054 | 0.000 | HIGH |
| 13588 | 1.005 | 0.002 | 0.050 | 0.000 | HIGH |
| 13589 | 0.352 | 0.001 | 0.029 | 0.000 | HIGH |
| 13590 | 1.394 | 0.003 | 0.106 | 0.001 | HIGH |
| 13591 | 0.471 | 0.001 | 0.090 | 0.001 | HIGH |
| 13592 | -0.472 | 0.001 | 0.040 | 0.000 | HIGH |
| 13594 | -2.676 | 0.005 | 0.107 | 0.001 | HIGH |
| 22201 | 0.048 | 0.000 | 0.259 | 0.002 | HIGH |
| 22202 | -5.169 | 0.010 | 0.174 | 0.001 | HIGH |
| 22203 | -6.128 | 0.012 | 0.054 | 0.000 | HIGH |
| 22204 | 2.832 | 0.005 | 0.096 | 0.001 | HIGH |
| 22205 | -1.845 | 0.003 | 2.059 | 0.013 | HIGH |
| 22206 | 0.659 | 0.001 | 1.828 | 0.012 | HIGH |
| 22207 | 2.820 | 0.005 | 1.853 | 0.012 | HIGH |
| 22208 | -1.364 | 0.003 | 3.517 | 0.022 | HIGH |
| 22215 | -0.294 | 0.001 | 0.216 | 0.001 | HIGH |
| 22216 | 1.313 | 0.002 | 0.155 | 0.001 | HIGH |
| 22222 | 2.554 | 0.005 | 4.825 | 0.031 | HIGH |
| 22223 | 7.703 | 0.015 | 6.966 | 0.044 | HIGH |
| 22224 | 0.003 | 0.000 | 0.355 | 0.002 | HIGH |
| 22225 | 1.412 | 0.003 | 0.156 | 0.001 | HIGH |
| 22226 | 1.434 | 0.003 | 0.087 | 0.001 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22227 | 0.864 | 0.002 | 0.344 | 0.002 | HIGH |
| 22228 | 0.319 | 0.001 | 0.777 | 0.005 | HIGH |
| 22229 | -0.205 | 0.000 | 1.590 | 0.010 | HIGH |
| 22230 | 0.271 | 0.001 | 1.917 | 0.012 | HIGH |
| 22231 | 2.111 | 0.004 | 7.267 | 0.046 | HIGH |
| 22232 | 6.115 | 0.012 | 10.219 | 0.065 | HIGH |
| 22233 | 5.294 | 0.010 | 15.324 | 0.098 | HIGH |
| 22234 | -0.973 | 0.002 | 0.557 | 0.004 | HIGH |
| 22235 | 1.017 | 0.002 | 0.155 | 0.001 | HIGH |
| 22236 | 1.478 | 0.003 | 0.091 | 0.001 | HIGH |
| 22237 | 1.281 | 0.002 | 0.376 | 0.002 | HIGH |
| 22238 | 0.825 | 0.002 | 0.964 | 0.006 | HIGH |
| 22239 | 0.603 | 0.001 | 1.844 | 0.012 | HIGH |
| 22240 | 0.854 | 0.002 | 2.033 | 0.013 | HIGH |
| 22241 | 1.734 | 0.003 | 2.696 | 0.017 | HIGH |
| 22242 | 2.623 | 0.005 | 28.777 | 0.184 | HIGH |
| 22243 | 0.273 | 0.001 | 0.230 | 0.001 | HIGH |
| 22244 | 2.979 | 0.006 | 42.839 | 0.274 | 8.17 |
| 22245 | -0.346 | 0.001 | 0.183 | 0.001 | HIGH |
| 22246 | -1.653 | 0.003 | 0.098 | 0.001 | HIGH |
| 22247 | 2.005 | 0.004 | 0.163 | 0.001 | HIGH |
| 22248 | 1.476 | 0.003 | 0.195 | 0.001 | HIGH |
| 22249 | 0.865 | 0.002 | 0.560 | 0.004 | HIGH |
| 22250 | 0.641 | 0.001 | 1.331 | 0.008 | HIGH |
| 22251 | 1.121 | 0.002 | 1.804 | 0.012 | HIGH |
| 22252 | 1.692 | 0.003 | 2.053 | 0.013 | HIGH |
| 22253 | 2.575 | 0.005 | 6.341 | 0.040 | HIGH |
| 22254 | 2.722 | 0.005 | 18.183 | 0.116 | HIGH |
| 22255 | -5.510 | 0.010 | 22.302 | 0.142 | HIGH |
| 22256 | -3.957 | 0.007 | 3.527 | 0.023 | HIGH |
| 22257 | -0.689 | 0.001 | 0.168 | 0.001 | HIGH |
| 22258 | 0.127 | 0.000 | 0.030 | 0.000 | HIGH |
| 22259 | -0.433 | 0.001 | 0.116 | 0.001 | HIGH |
| 22260 | 1.310 | 0.002 | 0.115 | 0.001 | HIGH |
| 22261 | 0.369 | 0.001 | 0.221 | 0.001 | HIGH |
| 22262 | -0.054 | 0.000 | 0.244 | 0.002 | HIGH |
| 22263 | 0.991 | 0.002 | 0.812 | 0.005 | HIGH |
| 22264 | 0.933 | 0.002 | 0.882 | 0.006 | HIGH |
| 22265 | 0.912 | 0.002 | 0.895 | 0.006 | HIGH |
| 22266 | -0.012 | 0.000 | 5.235 | 0.033 | HIGH |
| 22267 | -2.009 | 0.004 | 8.697 | 0.056 | HIGH |
| 22268 | -1.844 | 0.003 | 5.712 | 0.036 | HIGH |
| 22269 | -2.964 | 0.006 | 1.612 | 0.010 | HIGH |
| 22270 | 2.683 | 0.005 | 0.259 | 0.002 | HIGH |
| 22271 | 2.091 | 0.004 | 0.123 | 0.001 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22272 | 2.800 | 0.005 | 0.168 | 0.001 | HIGH |
| 22273 | 1.156 | 0.002 | 0.119 | 0.001 | HIGH |
| 22274 | 0.476 | 0.001 | 0.041 | 0.000 | HIGH |
| 22275 | -3.852 | 0.007 | 0.129 | 0.001 | HIGH |
| 22278 | 2.555 | 0.005 | 0.404 | 0.003 | HIGH |
| 22279 | 5.336 | 0.010 | 0.178 | 0.001 | HIGH |
| 22280 | 2.006 | 0.004 | 0.199 | 0.001 | HIGH |
| 22281 | 1.556 | 0.003 | 0.105 | 0.001 | HIGH |
| 22282 | 1.781 | 0.003 | 0.058 | 0.000 | HIGH |
| 22283 | -2.187 | 0.004 | 0.162 | 0.001 | HIGH |
| 22286 | 4.542 | 0.009 | 0.235 | 0.002 | HIGH |
| 22287 | 2.173 | 0.004 | 0.211 | 0.001 | HIGH |
| 22288 | 2.710 | 0.005 | 0.134 | 0.001 | HIGH |
| 22289 | 2.919 | 0.006 | 0.105 | 0.001 | HIGH |
| 22290 | 3.472 | 0.007 | 0.153 | 0.001 | HIGH |
| 22293 | 2.362 | 0.004 | 0.643 | 0.004 | HIGH |
| 22294 | 3.406 | 0.006 | 0.118 | 0.001 | HIGH |
| 22295 | 4.033 | 0.008 | 0.193 | 0.001 | HIGH |
| 22296 | 4.504 | 0.008 | 0.273 | 0.002 | HIGH |
| 22297 | 5.559 | 0.010 | 0.296 | 0.002 | HIGH |
| 22300 | 4.883 | 0.009 | 0.159 | 0.001 | HIGH |
| 22301 | 5.367 | 0.010 | 0.070 | 0.000 | HIGH |
| 22302 | 5.610 | 0.011 | 0.567 | 0.004 | HIGH |
| 22303 | 5.845 | 0.011 | 0.928 | 0.006 | HIGH |
| 22304 | 6.345 | 0.012 | 0.990 | 0.006 | HIGH |
| 22308 | 6.026 | 0.011 | 0.413 | 0.003 | HIGH |
| 22309 | 7.146 | 0.013 | 0.951 | 0.006 | HIGH |
| 22310 | 6.682 | 0.013 | 1.611 | 0.010 | HIGH |
| 22311 | 6.341 | 0.012 | 2.155 | 0.014 | HIGH |
| 22312 | 5.531 | 0.010 | 2.786 | 0.018 | HIGH |
| 22316 | 7.380 | 0.014 | 2.019 | 0.013 | HIGH |
| 22317 | 7.514 | 0.014 | 1.978 | 0.013 | HIGH |
| 22318 | 6.960 | 0.013 | 3.722 | 0.024 | HIGH |
| 22319 | 6.194 | 0.012 | 4.086 | 0.026 | HIGH |
| 22320 | 4.588 | 0.009 | 3.830 | 0.024 | HIGH |
| 22323 | 8.100 | 0.015 | 3.542 | 0.023 | HIGH |
| 22324 | 8.200 | 0.015 | 3.325 | 0.021 | HIGH |
| 22325 | 7.344 | 0.014 | 8.174 | 0.052 | HIGH |
| 22326 | 6.478 | 0.012 | 10.557 | 0.067 | HIGH |
| 22327 | 2.889 | 0.005 | 3.759 | 0.024 | HIGH |
| 22328 | 8.797 | 0.017 | 8.364 | 0.053 | HIGH |
| 22330 | 9.834 | 0.019 | 8.286 | 0.053 | HIGH |
| 22331 | 9.727 | 0.018 | 17.063 | 0.109 | HIGH |
| 22332 | 6.798 | 0.013 | 17.583 | 0.112 | HIGH |
| 22333 | 3.282 | 0.006 | 3.855 | 0.025 | HIGH |

422915

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22334 | 8.969 | 0.017 | 13.012 | 0.083 | HIGH |
| 22335 | 11.124 | 0.021 | 32.546 | 0.208 | HIGH |
| 22336 | 1.689 | 0.003 | 0.020 | 0.000 | HIGH |
| 22337 | 14.161 | 0.027 | 34.295 | 0.219 | 9.33 |
| 22338 | 5.853 | 0.011 | 9.051 | 0.058 | HIGH |
| 22339 | 5.674 | 0.011 | 13.655 | 0.087 | HIGH |
| 22340 | 12.428 | 0.023 | 2.622 | 0.017 | HIGH |
| 22341 | 3.004 | 0.006 | 1.283 | 0.008 | HIGH |
| 22342 | 4.330 | 0.008 | 1.730 | 0.011 | HIGH |
| 22343 | 0.869 | 0.002 | 0.608 | 0.004 | HIGH |
| 22346 | -0.758 | 0.001 | 5.652 | 0.036 | HIGH |
| 22347 | -3.440 | 0.006 | 16.562 | 0.106 | HIGH |
| 22348 | 0.534 | 0.001 | 5.186 | 0.033 | HIGH |
| 22349 | -1.505 | 0.003 | 14.030 | 0.090 | HIGH |
| 22350 | -2.295 | 0.004 | 3.214 | 0.021 | HIGH |
| 22351 | -1.073 | 0.002 | 0.830 | 0.005 | HIGH |
| 22353 | 1.008 | 0.002 | 11.213 | 0.072 | HIGH |
| 22354 | -3.118 | 0.006 | 3.770 | 0.024 | HIGH |
| 22355 | -7.042 | 0.013 | 15.258 | 0.097 | HIGH |
| 22356 | -0.916 | 0.002 | 0.030 | 0.000 | HIGH |
| 22357 | -3.218 | 0.006 | 15.638 | 0.100 | HIGH |
| 22358 | -3.347 | 0.006 | 6.261 | 0.040 | HIGH |
| 22361 | -3.581 | 0.007 | 7.074 | 0.045 | HIGH |
| 22362 | -5.293 | 0.010 | 5.382 | 0.034 | HIGH |
| 22363 | -6.167 | 0.012 | 7.735 | 0.049 | HIGH |
| 22364 | -6.287 | 0.012 | 6.754 | 0.043 | HIGH |
| 22365 | -4.184 | 0.008 | 12.023 | 0.077 | HIGH |
| 22368 | -5.928 | 0.011 | 3.541 | 0.023 | HIGH |
| 22369 | -6.095 | 0.012 | 2.166 | 0.014 | HIGH |
| 22370 | -6.851 | 0.013 | 5.649 | 0.036 | HIGH |
| 22371 | -7.716 | 0.015 | 5.829 | 0.037 | HIGH |
| 22372 | -6.692 | 0.013 | 11.092 | 0.071 | HIGH |
| 22375 | -7.661 | 0.014 | 1.508 | 0.010 | HIGH |
| 22376 | -7.118 | 0.013 | 1.442 | 0.009 | HIGH |
| 22377 | -7.449 | 0.014 | 2.838 | 0.018 | HIGH |
| 22378 | -8.004 | 0.015 | 3.077 | 0.020 | HIGH |
| 22379 | -7.915 | 0.015 | 5.986 | 0.038 | HIGH |
| 22383 | -8.223 | 0.016 | 0.541 | 0.003 | HIGH |
| 22384 | -7.636 | 0.015 | 0.559 | 0.004 | HIGH |
| 22385 | -7.602 | 0.014 | 1.158 | 0.007 | HIGH |
| 22386 | -8.068 | 0.015 | 1.242 | 0.008 | HIGH |
| 22387 | -7.946 | 0.015 | 2.286 | 0.015 | HIGH |
| 22390 | -8.436 | 0.016 | 0.154 | 0.001 | HIGH |
| 22391 | -8.038 | 0.015 | 0.150 | 0.001 | HIGH |
| 22392 | -7.574 | 0.014 | 0.408 | 0.003 | HIGH |

S22.5.5

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 22393 | -7.346 | 0.014 | 0.604 | 0.004 | HIGH |
| 22394 | -7.581 | 0.014 | 0.706 | 0.005 | HIGH |
| 22396 | -7.315 | 0.014 | 0.026 | 0.000 | HIGH |
| 22397 | -7.592 | 0.014 | 0.029 | 0.000 | HIGH |
| 22398 | -7.388 | 0.014 | 0.176 | 0.001 | HIGH |
| 22399 | -6.774 | 0.013 | 0.274 | 0.002 | HIGH |
| 22400 | -6.274 | 0.012 | 0.310 | 0.002 | HIGH |
| 22401 | -5.477 | 0.010 | 0.089 | 0.001 | HIGH |
| 22402 | -6.609 | 0.012 | 0.093 | 0.001 | HIGH |
| 22403 | -7.056 | 0.013 | 0.136 | 0.001 | HIGH |
| 22404 | -6.524 | 0.012 | 0.233 | 0.001 | HIGH |
| 22405 | -5.525 | 0.010 | 0.284 | 0.002 | HIGH |
| 22406 | -5.570 | 0.011 | 0.244 | 0.002 | HIGH |
| 22407 | -7.314 | 0.014 | 0.202 | 0.001 | HIGH |
| 22408 | -6.017 | 0.011 | 0.185 | 0.001 | HIGH |
| 22409 | -6.376 | 0.012 | 0.562 | 0.004 | HIGH |
| 22410 | -3.603 | 0.007 | 0.630 | 0.004 | HIGH |
| 22411 | -4.142 | 0.008 | 0.161 | 0.001 | HIGH |
| 22412 | -7.248 | 0.014 | 0.527 | 0.003 | HIGH |
| 22413 | -2.882 | 0.005 | 0.396 | 0.003 | HIGH |
| 22414 | -3.452 | 0.007 | 0.142 | 0.001 | HIGH |
| 22415 | -1.138 | 0.002 | 0.140 | 0.001 | HIGH |
| 23301 | 0.963 | 0.002 | 0.217 | 0.001 | HIGH |
| 23302 | -3.286 | 0.006 | 0.101 | 0.001 | HIGH |
| 23303 | -4.362 | 0.008 | 0.028 | 0.000 | HIGH |
| 23304 | 3.654 | 0.007 | 0.084 | 0.001 | HIGH |
| 23305 | -4.933 | 0.009 | 0.051 | 0.000 | HIGH |
| 23306 | 4.523 | 0.009 | 0.015 | 0.000 | HIGH |
| 23307 | -2.490 | 0.005 | 0.069 | 0.000 | HIGH |
| 23308 | 4.890 | 0.009 | 0.051 | 0.000 | HIGH |
| 23313 | 1.914 | 0.004 | 0.075 | 0.000 | HIGH |
| 23314 | 2.377 | 0.004 | 0.121 | 0.001 | HIGH |
| 23319 | -3.845 | 0.007 | 0.047 | 0.000 | HIGH |
| 23320 | -3.718 | 0.007 | 0.029 | 0.000 | HIGH |
| 23321 | 2.775 | 0.005 | 0.086 | 0.001 | HIGH |
| 23322 | 3.137 | 0.006 | 0.098 | 0.001 | HIGH |
| 23323 | 2.869 | 0.005 | 0.094 | 0.001 | HIGH |
| 23324 | -2.500 | 0.005 | 0.109 | 0.001 | HIGH |
| 23327 | 1.229 | 0.002 | 0.089 | 0.001 | HIGH |
| 23328 | -3.501 | 0.007 | 0.053 | 0.000 | HIGH |
| 23329 | -4.769 | 0.009 | 0.042 | 0.000 | HIGH |
| 23330 | -5.142 | 0.010 | 0.020 | 0.000 | HIGH |
| 23331 | 2.536 | 0.005 | 0.097 | 0.001 | HIGH |
| 23332 | 2.328 | 0.004 | 0.079 | 0.001 | HIGH |
| 23333 | 2.847 | 0.005 | 0.132 | 0.001 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23334 | 0.089 | 0.000 | 0.294 | 0.002 | HIGH |
| 23338 | -1.561 | 0.003 | 0.223 | 0.001 | HIGH |
| 23339 | -4.127 | 0.008 | 0.076 | 0.000 | HIGH |
| 23340 | -3.953 | 0.007 | 0.031 | 0.000 | HIGH |
| 23341 | -4.584 | 0.009 | 0.013 | 0.000 | HIGH |
| 23342 | 1.838 | 0.003 | 0.083 | 0.001 | HIGH |
| 23343 | 1.632 | 0.003 | 0.059 | 0.000 | HIGH |
| 23344 | 1.827 | 0.003 | 0.154 | 0.001 | HIGH |
| 23345 | 1.617 | 0.003 | 0.346 | 0.002 | HIGH |
| 23350 | -2.561 | 0.005 | 0.221 | 0.001 | HIGH |
| 23351 | -2.636 | 0.005 | 0.088 | 0.001 | HIGH |
| 23352 | -2.914 | 0.005 | 0.019 | 0.000 | HIGH |
| 23353 | -3.825 | 0.007 | 0.021 | 0.000 | HIGH |
| 23354 | 0.367 | 0.001 | 0.067 | 0.000 | HIGH |
| 23355 | 0.952 | 0.002 | 0.042 | 0.000 | HIGH |
| 23356 | 1.540 | 0.003 | 0.131 | 0.001 | HIGH |
| 23357 | 1.088 | 0.002 | 0.190 | 0.001 | HIGH |
| 23363 | -0.870 | 0.002 | 0.191 | 0.001 | HIGH |
| 23364 | -1.806 | 0.003 | 0.027 | 0.000 | HIGH |
| 23365 | -2.231 | 0.004 | 0.025 | 0.000 | HIGH |
| 23366 | -3.059 | 0.006 | 0.025 | 0.000 | HIGH |
| 23367 | -1.222 | 0.002 | 0.054 | 0.000 | HIGH |
| 23368 | 0.172 | 0.000 | 0.047 | 0.000 | HIGH |
| 23369 | 1.293 | 0.002 | 0.104 | 0.001 | HIGH |
| 23370 | 1.759 | 0.003 | 0.162 | 0.001 | HIGH |
| 23371 | 0.280 | 0.001 | 0.188 | 0.001 | HIGH |
| 23376 | 0.929 | 0.002 | 0.201 | 0.001 | HIGH |
| 23377 | -0.766 | 0.001 | 0.034 | 0.000 | HIGH |
| 23378 | -1.333 | 0.003 | 0.027 | 0.000 | HIGH |
| 23379 | -1.657 | 0.003 | 0.022 | 0.000 | HIGH |
| 23380 | -2.286 | 0.004 | 0.029 | 0.000 | HIGH |
| 23382 | 0.421 | 0.001 | 0.041 | 0.000 | HIGH |
| 23383 | 0.804 | 0.002 | 0.054 | 0.000 | HIGH |
| 23384 | 1.766 | 0.003 | 0.121 | 0.001 | HIGH |
| 23385 | 1.443 | 0.003 | 0.143 | 0.001 | HIGH |
| 23386 | 0.474 | 0.001 | 0.099 | 0.001 | HIGH |
| 23390 | 0.473 | 0.001 | 0.151 | 0.001 | HIGH |
| 23391 | 0.261 | 0.000 | 0.031 | 0.000 | HIGH |
| 23392 | -0.392 | 0.001 | 0.022 | 0.000 | HIGH |
| 23393 | -0.681 | 0.001 | 0.017 | 0.000 | HIGH |
| 23394 | -0.976 | 0.002 | 0.017 | 0.000 | HIGH |
| 23395 | -1.355 | 0.003 | 0.023 | 0.000 | HIGH |
| 23397 | 4.354 | 0.008 | 0.046 | 0.000 | HIGH |
| 23398 | 2.386 | 0.005 | 0.026 | 0.000 | HIGH |
| 23399 | 1.157 | 0.002 | 0.017 | 0.000 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23400 | 0.551 | 0.001 | 0.017 | 0.000 | HIGH |
| 23401 | -0.191 | 0.000 | 0.024 | 0.000 | HIGH |
| 23402 | -1.566 | 0.003 | 0.022 | 0.000 | HIGH |
| 23403 | -4.523 | 0.009 | 0.130 | 0.001 | HIGH |
| 23406 | 3.074 | 0.006 | 0.071 | 0.000 | HIGH |
| 23407 | 3.087 | 0.006 | 0.079 | 0.001 | HIGH |
| 23408 | 1.984 | 0.004 | 0.070 | 0.000 | HIGH |
| 23409 | 1.410 | 0.003 | 0.031 | 0.000 | HIGH |
| 23410 | 1.226 | 0.002 | 0.047 | 0.000 | HIGH |
| 23411 | 0.720 | 0.001 | 0.055 | 0.000 | HIGH |
| 23412 | 0.470 | 0.001 | 0.068 | 0.000 | HIGH |
| 23413 | -3.249 | 0.006 | 0.046 | 0.000 | HIGH |
| 23415 | 2.686 | 0.005 | 0.198 | 0.001 | HIGH |
| 23416 | 2.247 | 0.004 | 0.165 | 0.001 | HIGH |
| 23417 | 1.796 | 0.003 | 0.094 | 0.001 | HIGH |
| 23418 | 2.258 | 0.004 | 0.049 | 0.000 | HIGH |
| 23419 | 2.476 | 0.005 | 0.064 | 0.000 | HIGH |
| 23420 | 2.427 | 0.005 | 0.090 | 0.001 | HIGH |
| 23421 | 4.530 | 0.009 | 0.111 | 0.001 | HIGH |
| 23424 | 0.724 | 0.001 | 0.334 | 0.002 | HIGH |
| 23425 | 1.414 | 0.003 | 0.284 | 0.002 | HIGH |
| 23426 | 2.899 | 0.005 | 0.042 | 0.000 | HIGH |
| 23432 | -0.720 | 0.001 | 0.762 | 0.005 | HIGH |
| 23433 | 0.399 | 0.001 | 0.307 | 0.002 | HIGH |
| 23440 | -0.651 | 0.001 | 0.713 | 0.005 | HIGH |
| 23450 | -0.130 | 0.000 | 1.229 | 0.008 | HIGH |
| 23455 | 3.179 | 0.006 | 0.204 | 0.001 | HIGH |
| 23456 | 6.109 | 0.012 | 0.052 | 0.000 | HIGH |
| 23457 | 0.950 | 0.002 | 0.049 | 0.000 | HIGH |
| 23463 | 6.153 | 0.012 | 0.112 | 0.001 | HIGH |
| 23464 | 6.655 | 0.013 | 0.100 | 0.001 | HIGH |
| 23465 | 7.496 | 0.014 | 0.037 | 0.000 | HIGH |
| 23467 | -0.353 | 0.001 | 0.558 | 0.004 | HIGH |
| 23470 | 5.977 | 0.011 | 0.094 | 0.001 | HIGH |
| 23471 | 6.071 | 0.011 | 0.093 | 0.001 | HIGH |
| 23472 | 5.914 | 0.011 | 0.039 | 0.000 | HIGH |
| 23473 | 5.334 | 0.010 | 0.045 | 0.000 | HIGH |
| 23474 | 0.424 | 0.001 | 0.461 | 0.003 | HIGH |
| 23475 | 1.630 | 0.003 | 0.076 | 0.000 | HIGH |
| 23476 | 3.334 | 0.006 | 0.051 | 0.000 | HIGH |
| 23477 | 4.284 | 0.008 | 0.055 | 0.000 | HIGH |
| 23478 | 4.578 | 0.009 | 0.053 | 0.000 | HIGH |
| 23479 | 4.332 | 0.008 | 0.020 | 0.000 | HIGH |
| 23480 | 1.491 | 0.003 | 0.380 | 0.002 | HIGH |
| 23481 | 2.377 | 0.004 | 0.095 | 0.001 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23482 | 2.961 | 0.006 | 0.050 | 0.000 | HIGH |
| 23483 | 3.401 | 0.006 | 0.047 | 0.000 | HIGH |
| 23484 | 3.565 | 0.007 | 0.039 | 0.000 | HIGH |
| 23485 | 1.614 | 0.003 | 0.303 | 0.002 | HIGH |
| 23486 | 2.080 | 0.004 | 0.080 | 0.001 | HIGH |
| 23487 | 2.423 | 0.005 | 0.043 | 0.000 | HIGH |
| 23488 | 2.672 | 0.005 | 0.042 | 0.000 | HIGH |
| 23489 | 1.233 | 0.002 | 0.203 | 0.001 | HIGH |
| 23490 | 1.616 | 0.003 | 0.047 | 0.000 | HIGH |
| 23491 | 1.832 | 0.003 | 0.056 | 0.000 | HIGH |
| 23492 | 0.928 | 0.002 | 0.077 | 0.000 | HIGH |
| 23493 | 1.068 | 0.002 | 0.049 | 0.000 | HIGH |
| 23494 | 0.328 | 0.001 | 0.033 | 0.000 | HIGH |
| 23499 | 3.631 | 0.007 | 0.023 | 0.000 | HIGH |
| 23500 | 0.907 | 0.002 | 0.026 | 0.000 | HIGH |
| 23501 | -0.012 | 0.000 | 0.030 | 0.000 | HIGH |
| 23502 | -0.438 | 0.001 | 0.023 | 0.000 | HIGH |
| 23503 | -0.395 | 0.001 | 0.011 | 0.000 | HIGH |
| 23504 | -0.224 | 0.000 | 0.027 | 0.000 | HIGH |
| 23505 | -0.022 | 0.000 | 0.028 | 0.000 | HIGH |
| 23506 | 0.180 | 0.000 | 0.022 | 0.000 | HIGH |
| 23508 | -2.149 | 0.004 | 0.043 | 0.000 | HIGH |
| 23510 | -1.535 | 0.003 | 0.049 | 0.000 | HIGH |
| 23511 | -1.697 | 0.003 | 0.051 | 0.000 | HIGH |
| 23512 | -1.409 | 0.003 | 0.040 | 0.000 | HIGH |
| 23513 | -0.976 | 0.002 | 0.054 | 0.000 | HIGH |
| 23514 | -0.642 | 0.001 | 0.061 | 0.000 | HIGH |
| 23515 | -0.219 | 0.000 | 0.066 | 0.000 | HIGH |
| 23518 | -4.725 | 0.008 | 0.097 | 0.001 | HIGH |
| 23519 | -2.704 | 0.005 | 0.077 | 0.000 | HIGH |
| 23520 | -3.150 | 0.006 | 0.058 | 0.000 | HIGH |
| 23521 | -3.067 | 0.006 | 0.057 | 0.000 | HIGH |
| 23522 | -2.123 | 0.004 | 0.048 | 0.000 | HIGH |
| 23523 | -1.546 | 0.003 | 0.128 | 0.001 | HIGH |
| 23524 | -1.060 | 0.002 | 0.134 | 0.001 | HIGH |
| 23530 | -4.368 | 0.008 | 0.112 | 0.001 | HIGH |
| 23531 | -2.670 | 0.005 | 0.184 | 0.001 | HIGH |
| 23532 | -1.802 | 0.003 | 0.228 | 0.001 | HIGH |
| 23539 | -2.680 | 0.005 | 0.215 | 0.001 | HIGH |
| 23540 | -1.856 | 0.004 | 0.402 | 0.003 | HIGH |
| 23550 | -0.905 | 0.002 | 0.758 | 0.005 | HIGH |
| 23553 | -7.127 | 0.013 | 0.045 | 0.000 | HIGH |
| 23554 | -3.638 | 0.007 | 0.264 | 0.002 | HIGH |
| 23559 | 0.304 | 0.001 | 0.474 | 0.003 | HIGH |
| 23561 | -6.574 | 0.012 | 0.073 | 0.000 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 23562 | -6.566 | 0.012 | 0.124 | 0.001 | HIGH |
| 23563 | -5.731 | 0.011 | 0.132 | 0.001 | HIGH |
| 23568 | -4.037 | 0.008 | 0.122 | 0.001 | HIGH |
| 23569 | -4.956 | 0.009 | 0.058 | 0.000 | HIGH |
| 23570 | -5.457 | 0.010 | 0.159 | 0.001 | HIGH |
| 23571 | -5.230 | 0.010 | 0.174 | 0.001 | HIGH |
| 23574 | -0.336 | 0.001 | 0.341 | 0.002 | HIGH |
| 23575 | -3.567 | 0.007 | 0.154 | 0.001 | HIGH |
| 23576 | -3.975 | 0.007 | 0.060 | 0.000 | HIGH |
| 23577 | -4.152 | 0.008 | 0.119 | 0.001 | HIGH |
| 23578 | -3.684 | 0.007 | 0.118 | 0.001 | HIGH |
| 23579 | -2.194 | 0.004 | 0.144 | 0.001 | HIGH |
| 23580 | -1.111 | 0.002 | 0.280 | 0.002 | HIGH |
| 23581 | -2.965 | 0.006 | 0.157 | 0.001 | HIGH |
| 23582 | -3.257 | 0.006 | 0.073 | 0.000 | HIGH |
| 23583 | -3.824 | 0.007 | 0.122 | 0.001 | HIGH |
| 23584 | -4.269 | 0.008 | 0.238 | 0.002 | HIGH |
| 23585 | -3.714 | 0.007 | 0.659 | 0.004 | HIGH |
| 23586 | -2.078 | 0.004 | 0.145 | 0.001 | HIGH |
| 23587 | -2.925 | 0.006 | 0.112 | 0.001 | HIGH |
| 23588 | -4.020 | 0.008 | 0.209 | 0.001 | HIGH |
| 23589 | -4.540 | 0.009 | 0.634 | 0.004 | HIGH |
| 23590 | -1.537 | 0.003 | 0.106 | 0.001 | HIGH |
| 23591 | -2.976 | 0.006 | 0.160 | 0.001 | HIGH |
| 23592 | -2.949 | 0.006 | 0.251 | 0.002 | HIGH |
| 23594 | -3.336 | 0.006 | 0.127 | 0.001 | HIGH |
| 32201 | -4.956 | 0.009 | 0.398 | 0.003 | HIGH |
| 32202 | 2.140 | 0.004 | 0.292 | 0.002 | HIGH |
| 32204 | -1.419 | 0.003 | 0.014 | 0.000 | HIGH |
| 32205 | 0.499 | 0.001 | 0.035 | 0.000 | HIGH |
| 32206 | 0.687 | 0.001 | 0.032 | 0.000 | HIGH |
| 32207 | 1.000 | 0.002 | 0.082 | 0.001 | HIGH |
| 32208 | 0.414 | 0.001 | 0.047 | 0.000 | HIGH |
| 32215 | -12.632 | 0.024 | 0.330 | 0.002 | HIGH |
| 32216 | -7.279 | 0.014 | 0.073 | 0.000 | HIGH |
| 32222 | 0.485 | 0.001 | 0.026 | 0.000 | HIGH |
| 32223 | 1.120 | 0.002 | 0.041 | 0.000 | HIGH |
| 32224 | -12.535 | 0.024 | 2.428 | 0.016 | HIGH |
| 32225 | -10.988 | 0.021 | 0.622 | 0.004 | HIGH |
| 32226 | -3.647 | 0.007 | 0.007 | 0.000 | HIGH |
| 32227 | -0.442 | 0.001 | 0.072 | 0.000 | HIGH |
| 32228 | -0.365 | 0.001 | 0.020 | 0.000 | HIGH |
| 32229 | -0.002 | 0.000 | 0.046 | 0.000 | HIGH |
| 32230 | 0.231 | 0.000 | 0.037 | 0.000 | HIGH |
| 32231 | 0.458 | 0.001 | 0.062 | 0.000 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32232 | 0.171 | 0.000 | 0.008 | 0.000 | HIGH |
| 32233 | 0.723 | 0.001 | 0.229 | 0.001 | HIGH |
| 32234 | -10.507 | 0.020 | 1.993 | 0.013 | HIGH |
| 32235 | -3.528 | 0.007 | 0.977 | 0.006 | HIGH |
| 32236 | -3.854 | 0.007 | 0.031 | 0.000 | HIGH |
| 32237 | -2.751 | 0.005 | 0.037 | 0.000 | HIGH |
| 32238 | -1.062 | 0.002 | 0.029 | 0.000 | HIGH |
| 32239 | -0.747 | 0.001 | 0.030 | 0.000 | HIGH |
| 32240 | -0.385 | 0.001 | 0.021 | 0.000 | HIGH |
| 32241 | -0.182 | 0.000 | 0.027 | 0.000 | HIGH |
| 32242 | -0.042 | 0.000 | 0.035 | 0.000 | HIGH |
| 32243 | -0.052 | 0.000 | 0.038 | 0.000 | HIGH |
| 32244 | 0.720 | 0.001 | 0.151 | 0.001 | HIGH |
| 32245 | -1.566 | 0.003 | 0.616 | 0.004 | HIGH |
| 32246 | -1.816 | 0.003 | 0.587 | 0.004 | HIGH |
| 32247 | -2.537 | 0.005 | 0.083 | 0.001 | HIGH |
| 32248 | -2.275 | 0.004 | 0.043 | 0.000 | HIGH |
| 32249 | -1.020 | 0.002 | 0.075 | 0.000 | HIGH |
| 32250 | -1.037 | 0.002 | 0.070 | 0.000 | HIGH |
| 32251 | -0.689 | 0.001 | 0.039 | 0.000 | HIGH |
| 32252 | -0.483 | 0.001 | 0.057 | 0.000 | HIGH |
| 32253 | -0.288 | 0.001 | 0.058 | 0.000 | HIGH |
| 32254 | 0.098 | 0.000 | 0.052 | 0.000 | HIGH |
| 32255 | 0.049 | 0.000 | 0.022 | 0.000 | HIGH |
| 32256 | 0.221 | 0.000 | 0.112 | 0.001 | HIGH |
| 32257 | -1.139 | 0.002 | 0.443 | 0.003 | HIGH |
| 32258 | -0.083 | 0.000 | 0.092 | 0.001 | HIGH |
| 32259 | -0.613 | 0.001 | 0.174 | 0.001 | HIGH |
| 32260 | -1.085 | 0.002 | 0.224 | 0.001 | HIGH |
| 32261 | -0.616 | 0.001 | 0.657 | 0.004 | HIGH |
| 32262 | -0.758 | 0.001 | 0.127 | 0.001 | HIGH |
| 32263 | -0.620 | 0.001 | 0.061 | 0.000 | HIGH |
| 32264 | -0.429 | 0.001 | 0.036 | 0.000 | HIGH |
| 32265 | -0.503 | 0.001 | 0.078 | 0.000 | HIGH |
| 32266 | -0.207 | 0.000 | 0.056 | 0.000 | HIGH |
| 32267 | -0.038 | 0.000 | 0.022 | 0.000 | HIGH |
| 32268 | 0.150 | 0.000 | 0.037 | 0.000 | HIGH |
| 32269 | 0.166 | 0.000 | 0.042 | 0.000 | HIGH |
| 32270 | 2.531 | 0.005 | 0.681 | 0.004 | HIGH |
| 32271 | 1.670 | 0.003 | 0.076 | 0.000 | HIGH |
| 32272 | 1.706 | 0.003 | 0.213 | 0.001 | HIGH |
| 32273 | 1.043 | 0.002 | 0.230 | 0.001 | HIGH |
| 32274 | 2.600 | 0.005 | 0.248 | 0.002 | HIGH |
| 32275 | 4.426 | 0.008 | 0.088 | 0.001 | HIGH |
| 32278 | 2.522 | 0.005 | 0.409 | 0.003 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32279 | 3.331 | 0.006 | 0.126 | 0.001 | HIGH |
| 32280 | 0.349 | 0.001 | 0.007 | 0.000 | HIGH |
| 32281 | 0.702 | 0.001 | 0.011 | 0.000 | HIGH |
| 32282 | 0.277 | 0.001 | 0.011 | 0.000 | HIGH |
| 32283 | -0.424 | 0.001 | 0.065 | 0.000 | HIGH |
| 32286 | 2.546 | 0.005 | 0.230 | 0.001 | HIGH |
| 32287 | 2.172 | 0.004 | 0.048 | 0.000 | HIGH |
| 32288 | 1.658 | 0.003 | 0.032 | 0.000 | HIGH |
| 32289 | 0.838 | 0.002 | 0.015 | 0.000 | HIGH |
| 32290 | -0.505 | 0.001 | 0.019 | 0.000 | HIGH |
| 32293 | 1.530 | 0.003 | 1.224 | 0.008 | HIGH |
| 32294 | 1.845 | 0.003 | 0.176 | 0.001 | HIGH |
| 32295 | 0.079 | 0.000 | 0.011 | 0.000 | HIGH |
| 32296 | 0.578 | 0.001 | 0.015 | 0.000 | HIGH |
| 32297 | 0.664 | 0.001 | 0.082 | 0.001 | HIGH |
| 32300 | 1.209 | 0.002 | 1.464 | 0.009 | HIGH |
| 32301 | 1.385 | 0.003 | 0.048 | 0.000 | HIGH |
| 32302 | 1.270 | 0.002 | 0.008 | 0.000 | HIGH |
| 32303 | 0.991 | 0.002 | 0.039 | 0.000 | HIGH |
| 32304 | 0.657 | 0.001 | 0.049 | 0.000 | HIGH |
| 32308 | 1.935 | 0.004 | 0.497 | 0.003 | HIGH |
| 32309 | 1.799 | 0.003 | 0.059 | 0.000 | HIGH |
| 32310 | 1.463 | 0.003 | 0.043 | 0.000 | HIGH |
| 32311 | 1.116 | 0.002 | 0.091 | 0.001 | HIGH |
| 32312 | 0.629 | 0.001 | 0.045 | 0.000 | HIGH |
| 32316 | 1.934 | 0.004 | 0.252 | 0.002 | HIGH |
| 32317 | 1.752 | 0.003 | 0.060 | 0.000 | HIGH |
| 32318 | 1.557 | 0.003 | 0.056 | 0.000 | HIGH |
| 32319 | 1.367 | 0.003 | 0.052 | 0.000 | HIGH |
| 32320 | 0.435 | 0.001 | 0.029 | 0.000 | HIGH |
| 32323 | 1.801 | 0.003 | 0.117 | 0.001 | HIGH |
| 32324 | 1.882 | 0.004 | 0.086 | 0.001 | HIGH |
| 32325 | 1.701 | 0.003 | 0.058 | 0.000 | HIGH |
| 32326 | 1.574 | 0.003 | 0.008 | 0.000 | HIGH |
| 32327 | 0.870 | 0.002 | 0.004 | 0.000 | HIGH |
| 32329 | 2.401 | 0.005 | 0.297 | 0.002 | HIGH |
| 32330 | 2.098 | 0.004 | 0.112 | 0.001 | HIGH |
| 32331 | 1.724 | 0.003 | 0.032 | 0.000 | HIGH |
| 32332 | 1.742 | 0.003 | 0.031 | 0.000 | HIGH |
| 32333 | 1.234 | 0.002 | 0.152 | 0.001 | HIGH |
| 32334 | 2.205 | 0.004 | 0.277 | 0.002 | HIGH |
| 32335 | 2.051 | 0.004 | 0.108 | 0.001 | HIGH |
| 32336 | 0.917 | 0.002 | 0.029 | 0.000 | HIGH |
| 32337 | 2.016 | 0.004 | 0.104 | 0.001 | HIGH |
| 32338 | 1.486 | 0.003 | 0.211 | 0.001 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32339 | 1.321 | 0.002 | 0.063 | 0.000 | HIGH |
| 32340 | 1.295 | 0.002 | 0.112 | 0.001 | HIGH |
| 32341 | 0.845 | 0.002 | 0.111 | 0.001 | HIGH |
| 32342 | 0.943 | 0.002 | 0.100 | 0.001 | HIGH |
| 32343 | 0.487 | 0.001 | 0.043 | 0.000 | HIGH |
| 32346 | 0.192 | 0.000 | 0.029 | 0.000 | HIGH |
| 32347 | -0.397 | 0.001 | 0.028 | 0.000 | HIGH |
| 32348 | -0.602 | 0.001 | 0.126 | 0.001 | HIGH |
| 32349 | -0.678 | 0.001 | 0.024 | 0.000 | HIGH |
| 32350 | -0.896 | 0.002 | 0.004 | 0.000 | HIGH |
| 32351 | -0.827 | 0.002 | 0.013 | 0.000 | HIGH |
| 32353 | -0.391 | 0.001 | 0.033 | 0.000 | HIGH |
| 32354 | -0.547 | 0.001 | 0.016 | 0.000 | HIGH |
| 32355 | -1.038 | 0.002 | 0.041 | 0.000 | HIGH |
| 32356 | -1.022 | 0.002 | 0.030 | 0.000 | HIGH |
| 32357 | -1.049 | 0.002 | 0.034 | 0.000 | HIGH |
| 32358 | -1.239 | 0.002 | 0.034 | 0.000 | HIGH |
| 32361 | -0.343 | 0.001 | 0.018 | 0.000 | HIGH |
| 32362 | -0.717 | 0.001 | 0.032 | 0.000 | HIGH |
| 32363 | -0.853 | 0.002 | 0.046 | 0.000 | HIGH |
| 32364 | -1.231 | 0.002 | 0.083 | 0.001 | HIGH |
| 32365 | -1.386 | 0.003 | 0.086 | 0.001 | HIGH |
| 32368 | -0.157 | 0.000 | 0.022 | 0.000 | HIGH |
| 32369 | -0.549 | 0.001 | 0.015 | 0.000 | HIGH |
| 32370 | -0.747 | 0.001 | 0.021 | 0.000 | HIGH |
| 32371 | -0.932 | 0.002 | 0.124 | 0.001 | HIGH |
| 32372 | -1.197 | 0.002 | 0.179 | 0.001 | HIGH |
| 32375 | -0.094 | 0.000 | 0.018 | 0.000 | HIGH |
| 32376 | -0.439 | 0.001 | 0.009 | 0.000 | HIGH |
| 32377 | -0.792 | 0.001 | 0.014 | 0.000 | HIGH |
| 32378 | -0.987 | 0.002 | 0.067 | 0.000 | HIGH |
| 32379 | -0.869 | 0.002 | 0.428 | 0.003 | HIGH |
| 32383 | -0.737 | 0.001 | 0.039 | 0.000 | HIGH |
| 32384 | -0.827 | 0.002 | 0.017 | 0.000 | HIGH |
| 32385 | -1.098 | 0.002 | 0.015 | 0.000 | HIGH |
| 32386 | -1.431 | 0.003 | 0.027 | 0.000 | HIGH |
| 32387 | -1.595 | 0.003 | 0.157 | 0.001 | HIGH |
| 32390 | 0.623 | 0.001 | 0.034 | 0.000 | HIGH |
| 32391 | -0.666 | 0.001 | 0.025 | 0.000 | HIGH |
| 32392 | -1.949 | 0.004 | 0.057 | 0.000 | HIGH |
| 32393 | -1.863 | 0.004 | 0.134 | 0.001 | HIGH |
| 32394 | -1.964 | 0.004 | 0.154 | 0.001 | HIGH |
| 32396 | 3.642 | 0.007 | 0.071 | 0.000 | HIGH |
| 32397 | -2.524 | 0.005 | 0.019 | 0.000 | HIGH |
| 32398 | -3.785 | 0.007 | 0.038 | 0.000 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 32399 | -1.976 | 0.004 | 0.129 | 0.001 | HIGH |
| 32400 | -1.958 | 0.004 | 0.385 | 0.002 | HIGH |
| 32401 | -2.942 | 0.006 | 0.608 | 0.004 | HIGH |
| 32402 | -8.024 | 0.015 | 0.605 | 0.004 | HIGH |
| 32403 | -5.134 | 0.010 | 0.035 | 0.000 | HIGH |
| 32404 | -5.116 | 0.010 | 0.119 | 0.001 | HIGH |
| 32405 | -1.830 | 0.003 | 4.107 | 0.026 | HIGH |
| 32406 | -11.357 | 0.021 | 1.645 | 0.011 | HIGH |
| 32407 | -7.220 | 0.014 | 0.556 | 0.004 | HIGH |
| 32408 | -4.524 | 0.009 | 0.125 | 0.001 | HIGH |
| 32409 | -5.218 | 0.010 | 1.131 | 0.007 | HIGH |
| 32410 | -9.208 | 0.017 | 2.245 | 0.014 | HIGH |
| 32411 | -6.680 | 0.013 | 0.270 | 0.002 | HIGH |
| 32412 | -6.380 | 0.012 | 0.279 | 0.002 | HIGH |
| 32413 | -2.962 | 0.006 | 0.732 | 0.005 | HIGH |
| 32414 | -3.758 | 0.007 | 0.374 | 0.002 | HIGH |
| 32415 | 0.031 | 0.000 | 0.920 | 0.006 | HIGH |
| 32425 | -2.216 | 0.004 | 0.060 | 0.000 | HIGH |
| 32426 | -1.972 | 0.004 | 0.023 | 0.000 | HIGH |
| 32427 | -4.288 | 0.008 | 0.025 | 0.000 | HIGH |
| 32443 | -2.562 | 0.005 | 0.032 | 0.000 | HIGH |
| 32444 | -1.338 | 0.003 | 0.323 | 0.002 | HIGH |
| 32445 | -5.172 | 0.010 | 0.322 | 0.002 | HIGH |
| 32446 | -1.725 | 0.003 | 0.477 | 0.003 | HIGH |
| 32447 | -1.934 | 0.004 | 1.216 | 0.008 | HIGH |
| 32463 | 2.002 | 0.004 | 0.082 | 0.001 | HIGH |
| 32464 | -6.860 | 0.013 | 0.067 | 0.000 | HIGH |
| 32465 | 0.486 | 0.001 | 0.072 | 0.000 | HIGH |
| 33301 | 3.760 | 0.007 | 0.076 | 0.000 | HIGH |
| 33302 | -3.938 | 0.007 | 0.084 | 0.001 | HIGH |
| 33303 | -3.154 | 0.006 | 0.075 | 0.000 | HIGH |
| 33304 | 4.838 | 0.009 | 0.011 | 0.000 | HIGH |
| 33305 | -0.319 | 0.001 | 0.055 | 0.000 | HIGH |
| 33306 | 0.798 | 0.002 | 0.048 | 0.000 | HIGH |
| 33307 | 0.513 | 0.001 | 0.117 | 0.001 | HIGH |
| 33308 | -0.227 | 0.000 | 0.074 | 0.000 | HIGH |
| 33313 | 3.746 | 0.007 | 0.025 | 0.000 | HIGH |
| 33314 | 4.122 | 0.008 | 0.019 | 0.000 | HIGH |
| 33319 | 0.242 | 0.000 | 0.041 | 0.000 | HIGH |
| 33320 | 0.677 | 0.001 | 0.261 | 0.002 | HIGH |
| 33321 | 4.800 | 0.009 | 0.048 | 0.000 | HIGH |
| 33322 | 4.298 | 0.008 | 0.041 | 0.000 | HIGH |
| 33323 | 2.608 | 0.005 | 0.069 | 0.000 | HIGH |
| 33324 | -0.321 | 0.001 | 0.133 | 0.001 | HIGH |
| 33327 | 1.800 | 0.003 | 0.117 | 0.001 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33328 | 0.035 | 0.000 | 0.092 | 0.001 | HIGH |
| 33329 | 0.451 | 0.001 | 0.075 | 0.000 | HIGH |
| 33330 | 1.010 | 0.002 | 0.298 | 0.002 | HIGH |
| 33331 | 4.044 | 0.008 | 0.097 | 0.001 | HIGH |
| 33332 | 3.559 | 0.007 | 0.061 | 0.000 | HIGH |
| 33333 | 3.350 | 0.006 | 0.109 | 0.001 | HIGH |
| 33334 | 1.722 | 0.003 | 0.299 | 0.002 | HIGH |
| 33338 | 1.344 | 0.003 | 0.293 | 0.002 | HIGH |
| 33339 | 0.621 | 0.001 | 0.144 | 0.001 | HIGH |
| 33340 | 0.913 | 0.002 | 0.123 | 0.001 | HIGH |
| 33341 | 1.191 | 0.002 | 0.213 | 0.001 | HIGH |
| 33342 | 3.254 | 0.006 | 0.118 | 0.001 | HIGH |
| 33343 | 2.546 | 0.005 | 0.048 | 0.000 | HIGH |
| 33344 | 2.345 | 0.004 | 0.156 | 0.001 | HIGH |
| 33345 | 2.199 | 0.004 | 0.349 | 0.002 | HIGH |
| 33350 | 1.023 | 0.002 | 0.397 | 0.003 | HIGH |
| 33351 | 0.963 | 0.002 | 0.152 | 0.001 | HIGH |
| 33352 | 1.135 | 0.002 | 0.116 | 0.001 | HIGH |
| 33353 | 1.528 | 0.003 | 0.096 | 0.001 | HIGH |
| 33354 | 2.461 | 0.005 | 0.112 | 0.001 | HIGH |
| 33355 | 1.706 | 0.003 | 0.058 | 0.000 | HIGH |
| 33356 | 1.547 | 0.003 | 0.120 | 0.001 | HIGH |
| 33357 | 0.942 | 0.002 | 0.264 | 0.002 | HIGH |
| 33363 | 0.778 | 0.001 | 0.268 | 0.002 | HIGH |
| 33364 | 0.921 | 0.002 | 0.082 | 0.001 | HIGH |
| 33365 | 1.387 | 0.003 | 0.065 | 0.000 | HIGH |
| 33366 | 2.494 | 0.005 | 0.050 | 0.000 | HIGH |
| 33367 | 1.619 | 0.003 | 0.073 | 0.000 | HIGH |
| 33368 | 0.943 | 0.002 | 0.057 | 0.000 | HIGH |
| 33369 | 0.868 | 0.002 | 0.058 | 0.000 | HIGH |
| 33370 | 0.739 | 0.001 | 0.173 | 0.001 | HIGH |
| 33371 | -0.314 | 0.001 | 0.198 | 0.001 | HIGH |
| 33376 | 0.158 | 0.000 | 0.137 | 0.001 | HIGH |
| 33377 | 0.290 | 0.001 | 0.123 | 0.001 | HIGH |
| 33378 | 0.772 | 0.001 | 0.028 | 0.000 | HIGH |
| 33379 | 1.527 | 0.003 | 0.032 | 0.000 | HIGH |
| 33380 | 3.243 | 0.006 | 0.064 | 0.000 | HIGH |
| 33381 | 0.527 | 0.001 | 0.033 | 0.000 | HIGH |
| 33382 | 0.167 | 0.000 | 0.029 | 0.000 | HIGH |
| 33383 | 0.078 | 0.000 | 0.031 | 0.000 | HIGH |
| 33384 | 0.040 | 0.000 | 0.054 | 0.000 | HIGH |
| 33385 | 0.005 | 0.000 | 0.120 | 0.001 | HIGH |
| 33386 | -0.333 | 0.001 | 0.261 | 0.002 | HIGH |
| 33390 | -0.455 | 0.001 | 0.136 | 0.001 | HIGH |
| 33391 | -0.436 | 0.001 | 0.063 | 0.000 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33392 | -0.185 | 0.000 | 0.030 | 0.000 | HIGH |
| 33393 | 0.200 | 0.000 | 0.013 | 0.000 | HIGH |
| 33394 | 0.541 | 0.001 | 0.035 | 0.000 | HIGH |
| 33396 | 1.343 | 0.003 | 0.008 | 0.000 | HIGH |
| 33397 | 1.323 | 0.002 | 0.002 | 0.000 | HIGH |
| 33398 | 1.343 | 0.003 | 0.012 | 0.000 | HIGH |
| 33399 | 1.345 | 0.003 | 0.024 | 0.000 | HIGH |
| 33400 | 1.262 | 0.002 | 0.036 | 0.000 | HIGH |
| 33401 | 0.928 | 0.002 | 0.036 | 0.000 | HIGH |
| 33402 | 0.450 | 0.001 | 0.035 | 0.000 | HIGH |
| 33403 | -1.409 | 0.003 | 0.199 | 0.001 | HIGH |
| 33406 | 1.246 | 0.002 | 0.005 | 0.000 | HIGH |
| 33407 | 1.558 | 0.003 | 0.035 | 0.000 | HIGH |
| 33408 | 1.645 | 0.003 | 0.042 | 0.000 | HIGH |
| 33409 | 1.814 | 0.003 | 0.051 | 0.000 | HIGH |
| 33410 | 2.025 | 0.004 | 0.064 | 0.000 | HIGH |
| 33411 | 2.243 | 0.004 | 0.065 | 0.000 | HIGH |
| 33412 | 3.385 | 0.006 | 0.115 | 0.001 | HIGH |
| 33413 | 1.826 | 0.003 | 0.339 | 0.002 | HIGH |
| 33415 | 1.506 | 0.003 | 0.063 | 0.000 | HIGH |
| 33416 | 1.816 | 0.003 | 0.097 | 0.001 | HIGH |
| 33417 | 1.958 | 0.004 | 0.087 | 0.001 | HIGH |
| 33418 | 2.572 | 0.005 | 0.067 | 0.000 | HIGH |
| 33419 | 2.728 | 0.005 | 0.078 | 0.000 | HIGH |
| 33420 | 2.489 | 0.005 | 0.078 | 0.001 | HIGH |
| 33421 | 4.379 | 0.008 | 0.066 | 0.000 | HIGH |
| 33424 | 1.435 | 0.003 | 0.266 | 0.002 | HIGH |
| 33425 | 1.764 | 0.003 | 0.227 | 0.001 | HIGH |
| 33426 | 2.824 | 0.005 | 0.088 | 0.001 | HIGH |
| 33432 | -0.091 | 0.000 | 0.495 | 0.003 | HIGH |
| 33433 | 0.449 | 0.001 | 0.334 | 0.002 | HIGH |
| 33440 | -2.128 | 0.004 | 1.288 | 0.008 | HIGH |
| 33450 | -2.043 | 0.004 | 1.481 | 0.009 | HIGH |
| 33455 | 0.349 | 0.001 | 0.186 | 0.001 | HIGH |
| 33456 | 1.953 | 0.004 | 0.071 | 0.000 | HIGH |
| 33457 | 1.422 | 0.003 | 0.026 | 0.000 | HIGH |
| 33463 | 0.547 | 0.001 | 0.106 | 0.001 | HIGH |
| 33464 | 1.097 | 0.002 | 0.090 | 0.001 | HIGH |
| 33465 | 0.692 | 0.001 | 0.110 | 0.001 | HIGH |
| 33467 | 0.295 | 0.001 | 0.125 | 0.001 | HIGH |
| 33470 | 0.482 | 0.001 | 0.162 | 0.001 | HIGH |
| 33471 | 0.557 | 0.001 | 0.146 | 0.001 | HIGH |
| 33472 | 0.281 | 0.001 | 0.142 | 0.001 | HIGH |
| 33473 | -0.141 | 0.000 | 0.206 | 0.001 | HIGH |
| 33474 | 0.572 | 0.001 | 0.372 | 0.002 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33475 | 0.368 | 0.001 | 0.070 | 0.000 | HIGH |
| 33476 | 0.254 | 0.000 | 0.117 | 0.001 | HIGH |
| 33477 | 0.129 | 0.000 | 0.118 | 0.001 | HIGH |
| 33478 | -0.025 | 0.000 | 0.136 | 0.001 | HIGH |
| 33479 | -0.166 | 0.000 | 0.400 | 0.003 | HIGH |
| 33480 | 0.779 | 0.001 | 0.311 | 0.002 | HIGH |
| 33481 | 0.616 | 0.001 | 0.134 | 0.001 | HIGH |
| 33482 | 0.155 | 0.000 | 0.121 | 0.001 | HIGH |
| 33483 | -0.291 | 0.001 | 0.097 | 0.001 | HIGH |
| 33484 | -0.472 | 0.001 | 0.406 | 0.003 | HIGH |
| 33485 | 0.841 | 0.002 | 0.178 | 0.001 | HIGH |
| 33486 | 0.621 | 0.001 | 0.152 | 0.001 | HIGH |
| 33487 | -0.110 | 0.000 | 0.111 | 0.001 | HIGH |
| 33488 | -0.865 | 0.002 | 0.307 | 0.002 | HIGH |
| 33489 | 1.180 | 0.002 | 0.173 | 0.001 | HIGH |
| 33490 | 1.061 | 0.002 | 0.143 | 0.001 | HIGH |
| 33491 | -0.273 | 0.001 | 0.198 | 0.001 | HIGH |
| 33492 | 3.691 | 0.007 | 0.157 | 0.001 | HIGH |
| 33499 | 0.979 | 0.002 | 0.078 | 0.000 | HIGH |
| 33500 | 0.280 | 0.001 | 0.027 | 0.000 | HIGH |
| 33501 | -0.279 | 0.001 | 0.041 | 0.000 | HIGH |
| 33502 | -0.572 | 0.001 | 0.031 | 0.000 | HIGH |
| 33503 | -0.906 | 0.002 | 0.010 | 0.000 | HIGH |
| 33504 | -1.889 | 0.004 | 0.028 | 0.000 | HIGH |
| 33505 | -3.729 | 0.007 | 0.235 | 0.001 | HIGH |
| 33508 | 0.265 | 0.001 | 0.020 | 0.000 | HIGH |
| 33510 | -0.184 | 0.000 | 0.014 | 0.000 | HIGH |
| 33511 | -0.464 | 0.001 | 0.012 | 0.000 | HIGH |
| 33512 | -0.624 | 0.001 | 0.003 | 0.000 | HIGH |
| 33513 | -1.077 | 0.002 | 0.035 | 0.000 | HIGH |
| 33514 | -1.816 | 0.003 | 0.090 | 0.001 | HIGH |
| 33515 | -1.960 | 0.004 | 0.107 | 0.001 | HIGH |
| 33518 | -1.985 | 0.004 | 0.058 | 0.000 | HIGH |
| 33519 | -0.943 | 0.002 | 0.042 | 0.000 | HIGH |
| 33520 | -0.482 | 0.001 | 0.057 | 0.000 | HIGH |
| 33521 | -0.412 | 0.001 | 0.040 | 0.000 | HIGH |
| 33522 | -0.542 | 0.001 | 0.047 | 0.000 | HIGH |
| 33523 | -1.008 | 0.002 | 0.080 | 0.001 | HIGH |
| 33524 | -1.255 | 0.002 | 0.092 | 0.001 | HIGH |
| 33530 | -0.132 | 0.000 | 0.080 | 0.001 | HIGH |
| 33531 | -0.250 | 0.000 | 0.134 | 0.001 | HIGH |
| 33532 | -0.401 | 0.001 | 0.154 | 0.001 | HIGH |
| 33538 | 0.606 | 0.001 | 0.210 | 0.001 | HIGH |
| 33540 | 0.520 | 0.001 | 0.255 | 0.002 | HIGH |
| 33550 | 1.660 | 0.003 | 0.630 | 0.004 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 33553 | -3.114 | 0.006 | 0.159 | 0.001 | HIGH |
| 33554 | -1.015 | 0.002 | 0.258 | 0.002 | HIGH |
| 33559 | 0.845 | 0.002 | 1.003 | 0.006 | HIGH |
| 33561 | -5.411 | 0.010 | 0.118 | 0.001 | HIGH |
| 33562 | -4.172 | 0.008 | 0.127 | 0.001 | HIGH |
| 33563 | -3.820 | 0.007 | 0.135 | 0.001 | HIGH |
| 33568 | -4.108 | 0.008 | 0.089 | 0.001 | HIGH |
| 33569 | -4.493 | 0.008 | 0.081 | 0.001 | HIGH |
| 33570 | -4.269 | 0.008 | 0.149 | 0.001 | HIGH |
| 33571 | -4.104 | 0.008 | 0.159 | 0.001 | HIGH |
| 33574 | 0.156 | 0.000 | 0.417 | 0.003 | HIGH |
| 33575 | -3.464 | 0.007 | 0.108 | 0.001 | HIGH |
| 33576 | -3.709 | 0.007 | 0.046 | 0.000 | HIGH |
| 33577 | -3.493 | 0.007 | 0.106 | 0.001 | HIGH |
| 33578 | -2.873 | 0.005 | 0.107 | 0.001 | HIGH |
| 33579 | -1.808 | 0.003 | 0.130 | 0.001 | HIGH |
| 33580 | -1.277 | 0.002 | 0.790 | 0.005 | HIGH |
| 33581 | -3.202 | 0.006 | 0.127 | 0.001 | HIGH |
| 33582 | -3.146 | 0.006 | 0.056 | 0.000 | HIGH |
| 33583 | -2.869 | 0.006 | 0.110 | 0.001 | HIGH |
| 33584 | -2.821 | 0.005 | 0.187 | 0.001 | HIGH |
| 33585 | -2.540 | 0.005 | 0.669 | 0.004 | HIGH |
| 33586 | -2.836 | 0.005 | 0.139 | 0.001 | HIGH |
| 33587 | -2.628 | 0.005 | 0.087 | 0.001 | HIGH |
| 33588 | -2.533 | 0.005 | 0.176 | 0.001 | HIGH |
| 33589 | -2.252 | 0.004 | 0.314 | 0.002 | HIGH |
| 33590 | -2.379 | 0.004 | 0.136 | 0.001 | HIGH |
| 33591 | -2.121 | 0.004 | 0.133 | 0.001 | HIGH |
| 33592 | -1.829 | 0.003 | 0.191 | 0.001 | HIGH |
| 33593 | -1.873 | 0.004 | 0.101 | 0.001 | HIGH |
| 33594 | -1.589 | 0.003 | 0.175 | 0.001 | HIGH |
| 33595 | -1.216 | 0.002 | 0.068 | 0.000 | HIGH |
| 42201 | -1.578 | 0.003 | 0.084 | 0.001 | HIGH |
| 42202 | 3.862 | 0.007 | 0.048 | 0.000 | HIGH |
| 42203 | 5.104 | 0.010 | 0.060 | 0.000 | HIGH |
| 42204 | -5.112 | 0.010 | 0.140 | 0.001 | HIGH |
| 42205 | 1.646 | 0.003 | 2.162 | 0.014 | HIGH |
| 42206 | -4.367 | 0.008 | 2.355 | 0.015 | HIGH |
| 42207 | -2.849 | 0.005 | 0.692 | 0.004 | HIGH |
| 42208 | -2.598 | 0.005 | 2.820 | 0.018 | HIGH |
| 42215 | -0.759 | 0.001 | 0.074 | 0.000 | HIGH |
| 42216 | -2.152 | 0.004 | 0.067 | 0.000 | HIGH |
| 42222 | -1.804 | 0.004 | 2.177 | 0.014 | HIGH |
| 42223 | -3.753 | 0.007 | 1.582 | 0.010 | HIGH |
| 42224 | -0.050 | 0.000 | 0.065 | 0.000 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42225 | -0.660 | 0.001 | 0.042 | 0.000 | HIGH |
| 42226 | 0.917 | 0.002 | 0.283 | 0.002 | HIGH |
| 42227 | 2.430 | 0.005 | 0.271 | 0.002 | HIGH |
| 42228 | 5.167 | 0.010 | 2.390 | 0.015 | HIGH |
| 42229 | -6.847 | 0.013 | 2.696 | 0.017 | HIGH |
| 42230 | -4.184 | 0.008 | 3.610 | 0.023 | HIGH |
| 42231 | -3.099 | 0.006 | 3.940 | 0.025 | HIGH |
| 42232 | -3.888 | 0.007 | 3.871 | 0.025 | HIGH |
| 42233 | -4.838 | 0.009 | 4.087 | 0.026 | HIGH |
| 42234 | 1.411 | 0.003 | 0.197 | 0.001 | HIGH |
| 42235 | 0.883 | 0.002 | 0.169 | 0.001 | HIGH |
| 42236 | 1.698 | 0.003 | 0.241 | 0.002 | HIGH |
| 42237 | 3.723 | 0.007 | 0.379 | 0.002 | HIGH |
| 42238 | 5.222 | 0.010 | 0.528 | 0.003 | HIGH |
| 42239 | 2.630 | 0.005 | 5.325 | 0.034 | HIGH |
| 42240 | -6.044 | 0.011 | 12.877 | 0.082 | HIGH |
| 42241 | -5.872 | 0.011 | 14.933 | 0.095 | HIGH |
| 42242 | -5.594 | 0.011 | 10.465 | 0.067 | HIGH |
| 42243 | -5.376 | 0.010 | 2.479 | 0.016 | HIGH |
| 42244 | -5.288 | 0.010 | 4.120 | 0.026 | HIGH |
| 42245 | 0.834 | 0.002 | 0.257 | 0.002 | HIGH |
| 42246 | 3.185 | 0.006 | 0.636 | 0.004 | HIGH |
| 42247 | 1.200 | 0.002 | 0.568 | 0.004 | HIGH |
| 42248 | 3.646 | 0.007 | 0.025 | 0.000 | HIGH |
| 42249 | 7.527 | 0.014 | 0.727 | 0.005 | HIGH |
| 42250 | 13.348 | 0.025 | 1.911 | 0.012 | HIGH |
| 42251 | -9.712 | 0.018 | 44.640 | 0.285 | 6.72 |
| 42252 | -1.489 | 0.003 | 0.115 | 0.001 | HIGH |
| 42253 | -11.512 | 0.022 | 40.547 | 0.259 | 7.64 |
| 42254 | -7.131 | 0.013 | 2.946 | 0.019 | HIGH |
| 42255 | -5.437 | 0.010 | 2.966 | 0.019 | HIGH |
| 42256 | -4.689 | 0.009 | 2.818 | 0.018 | HIGH |
| 42257 | 0.671 | 0.001 | 0.057 | 0.000 | HIGH |
| 42258 | 0.989 | 0.002 | 0.211 | 0.001 | HIGH |
| 42259 | 3.076 | 0.006 | 0.169 | 0.001 | HIGH |
| 42260 | 1.002 | 0.002 | 0.195 | 0.001 | HIGH |
| 42261 | 3.186 | 0.006 | 0.248 | 0.002 | HIGH |
| 42262 | 5.475 | 0.010 | 4.283 | 0.027 | HIGH |
| 42263 | 19.059 | 0.036 | 3.380 | 0.022 | HIGH |
| 42264 | -3.575 | 0.007 | 23.027 | 0.147 | HIGH |
| 42265 | -5.135 | 0.010 | 19.861 | 0.127 | HIGH |
| 42266 | -4.879 | 0.009 | 6.966 | 0.044 | HIGH |
| 42267 | -4.071 | 0.008 | 1.662 | 0.011 | HIGH |
| 42268 | -3.478 | 0.007 | 1.642 | 0.010 | HIGH |
| 42269 | -2.902 | 0.005 | 1.197 | 0.008 | HIGH |

5.5.259

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42270 | -0.497 | 0.001 | 0.043 | 0.000 | HIGH |
| 42271 | -0.830 | 0.002 | 0.087 | 0.001 | HIGH |
| 42272 | -1.816 | 0.003 | 0.238 | 0.002 | HIGH |
| 42273 | -1.424 | 0.003 | 0.067 | 0.000 | HIGH |
| 42274 | -1.229 | 0.002 | 0.023 | 0.000 | HIGH |
| 42275 | 2.816 | 0.005 | 0.075 | 0.000 | HIGH |
| 42278 | -0.984 | 0.002 | 0.179 | 0.001 | HIGH |
| 42279 | -2.039 | 0.004 | 0.264 | 0.002 | HIGH |
| 42280 | -2.224 | 0.004 | 0.125 | 0.001 | HIGH |
| 42281 | -3.041 | 0.006 | 0.055 | 0.000 | HIGH |
| 42282 | -4.384 | 0.008 | 0.045 | 0.000 | HIGH |
| 42283 | 0.881 | 0.002 | 0.055 | 0.000 | HIGH |
| 42286 | -0.628 | 0.001 | 0.168 | 0.001 | HIGH |
| 42287 | -1.234 | 0.002 | 0.248 | 0.002 | HIGH |
| 42288 | -3.656 | 0.007 | 0.204 | 0.001 | HIGH |
| 42289 | -5.680 | 0.011 | 0.256 | 0.002 | HIGH |
| 42290 | -7.404 | 0.014 | 0.333 | 0.002 | HIGH |
| 42293 | 0.221 | 0.000 | 0.508 | 0.003 | HIGH |
| 42294 | -1.969 | 0.004 | 0.635 | 0.004 | HIGH |
| 42295 | -5.813 | 0.011 | 0.619 | 0.004 | HIGH |
| 42296 | -7.321 | 0.014 | 0.812 | 0.005 | HIGH |
| 42297 | -10.286 | 0.019 | 1.112 | 0.007 | HIGH |
| 42300 | 0.102 | 0.000 | 1.185 | 0.008 | HIGH |
| 42301 | -2.137 | 0.004 | 1.321 | 0.008 | HIGH |
| 42302 | -7.891 | 0.015 | 1.382 | 0.009 | HIGH |
| 42303 | -5.338 | 0.010 | 1.283 | 0.008 | HIGH |
| 42304 | -9.099 | 0.017 | 1.439 | 0.009 | HIGH |
| 42308 | -0.416 | 0.001 | 5.167 | 0.033 | HIGH |
| 42309 | 0.742 | 0.001 | 0.339 | 0.002 | HIGH |
| 42310 | -8.475 | 0.016 | 4.527 | 0.029 | HIGH |
| 42311 | -8.179 | 0.015 | 4.526 | 0.029 | HIGH |
| 42312 | -9.983 | 0.019 | 4.403 | 0.028 | HIGH |
| 42316 | 1.785 | 0.003 | 2.535 | 0.016 | HIGH |
| 42317 | 1.842 | 0.003 | 27.654 | 0.177 | HIGH |
| 42318 | -6.906 | 0.013 | 12.407 | 0.079 | HIGH |
| 42319 | -7.070 | 0.013 | 10.210 | 0.065 | HIGH |
| 42320 | -8.354 | 0.016 | 3.823 | 0.024 | HIGH |
| 42323 | 6.754 | 0.013 | 24.334 | 0.155 | HIGH |
| 42324 | 0.662 | 0.001 | 0.173 | 0.001 | HIGH |
| 42325 | -5.410 | 0.010 | 33.705 | 0.215 | HIGH |
| 42326 | -5.641 | 0.011 | 3.733 | 0.024 | HIGH |
| 42327 | -4.835 | 0.009 | 4.637 | 0.030 | HIGH |
| 42329 | 1.749 | 0.003 | 18.597 | 0.119 | HIGH |
| 42330 | 1.407 | 0.003 | 14.861 | 0.095 | HIGH |
| 42331 | -2.921 | 0.006 | 10.206 | 0.065 | HIGH |

042.515

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42332 | -3.105 | 0.006 | 3.365 | 0.021 | HIGH |
| 42333 | -2.120 | 0.004 | 3.690 | 0.024 | HIGH |
| 42334 | 1.219 | 0.002 | 12.848 | 0.082 | HIGH |
| 42335 | 0.348 | 0.001 | 5.749 | 0.037 | HIGH |
| 42336 | -1.320 | 0.002 | 4.929 | 0.031 | HIGH |
| 42337 | -1.389 | 0.003 | 4.450 | 0.028 | HIGH |
| 42338 | 1.087 | 0.002 | 4.614 | 0.029 | HIGH |
| 42339 | 0.419 | 0.001 | 3.081 | 0.020 | HIGH |
| 42340 | -0.306 | 0.001 | 2.194 | 0.014 | HIGH |
| 42341 | 1.167 | 0.002 | 1.157 | 0.007 | HIGH |
| 42342 | 0.547 | 0.001 | 1.180 | 0.008 | HIGH |
| 42343 | 0.418 | 0.001 | 0.224 | 0.001 | HIGH |
| 42346 | -1.836 | 0.003 | 4.052 | 0.026 | HIGH |
| 42347 | 0.351 | 0.001 | 2.526 | 0.016 | HIGH |
| 42348 | 1.195 | 0.002 | 2.549 | 0.016 | HIGH |
| 42349 | 1.004 | 0.002 | 2.195 | 0.014 | HIGH |
| 42350 | 0.218 | 0.000 | 1.386 | 0.009 | HIGH |
| 42351 | -0.339 | 0.001 | 1.474 | 0.009 | HIGH |
| 42353 | -2.933 | 0.006 | 9.979 | 0.064 | HIGH |
| 42354 | 1.288 | 0.002 | 3.538 | 0.023 | HIGH |
| 42355 | 2.006 | 0.004 | 7.478 | 0.048 | HIGH |
| 42356 | 1.780 | 0.003 | 7.560 | 0.048 | HIGH |
| 42357 | 0.114 | 0.000 | 3.551 | 0.023 | HIGH |
| 42358 | -0.406 | 0.001 | 3.821 | 0.024 | HIGH |
| 42361 | 5.125 | 0.010 | 7.345 | 0.047 | HIGH |
| 42362 | 3.893 | 0.007 | 5.760 | 0.037 | HIGH |
| 42363 | 3.578 | 0.007 | 13.670 | 0.087 | HIGH |
| 42364 | -0.749 | 0.001 | 9.010 | 0.058 | HIGH |
| 42365 | -1.499 | 0.003 | 8.084 | 0.052 | HIGH |
| 42368 | 10.601 | 0.020 | 4.783 | 0.031 | HIGH |
| 42369 | 7.756 | 0.015 | 4.636 | 0.030 | HIGH |
| 42370 | 7.600 | 0.014 | 13.017 | 0.083 | HIGH |
| 42371 | -3.701 | 0.007 | 23.535 | 0.150 | HIGH |
| 42372 | -3.819 | 0.007 | 17.407 | 0.111 | HIGH |
| 42375 | 12.895 | 0.024 | 1.737 | 0.011 | HIGH |
| 42376 | 4.458 | 0.008 | 3.267 | 0.021 | HIGH |
| 42377 | 4.735 | 0.009 | 11.899 | 0.076 | HIGH |
| 42378 | -0.954 | 0.002 | 0.129 | 0.001 | HIGH |
| 42379 | -2.841 | 0.005 | 18.634 | 0.119 | HIGH |
| 42383 | 9.585 | 0.018 | 0.821 | 0.005 | HIGH |
| 42384 | 7.767 | 0.015 | 0.529 | 0.003 | HIGH |
| 42385 | 10.377 | 0.020 | 1.319 | 0.008 | HIGH |
| 42386 | -2.675 | 0.005 | 6.588 | 0.042 | HIGH |
| 42387 | -2.265 | 0.004 | 7.497 | 0.048 | HIGH |
| 42390 | 8.562 | 0.016 | 0.231 | 0.001 | HIGH |

5.5.241

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 42391 | 6.879 | 0.013 | 0.371 | 0.002 | HIGH |
| 42392 | 5.423 | 0.010 | 0.519 | 0.003 | HIGH |
| 42393 | -0.320 | 0.001 | 1.236 | 0.008 | HIGH |
| 42394 | 1.040 | 0.002 | 2.343 | 0.015 | HIGH |
| 42396 | 5.843 | 0.011 | 0.116 | 0.001 | HIGH |
| 42397 | 5.932 | 0.011 | 0.202 | 0.001 | HIGH |
| 42398 | 3.945 | 0.007 | 0.120 | 0.001 | HIGH |
| 42399 | 0.105 | 0.000 | 0.450 | 0.003 | HIGH |
| 42400 | -2.360 | 0.004 | 1.589 | 0.010 | HIGH |
| 42401 | 3.574 | 0.007 | 0.077 | 0.000 | HIGH |
| 42402 | 4.177 | 0.008 | 0.079 | 0.001 | HIGH |
| 42403 | 3.388 | 0.006 | 0.236 | 0.002 | HIGH |
| 42404 | 0.968 | 0.002 | 0.194 | 0.001 | HIGH |
| 42405 | -1.335 | 0.003 | 0.601 | 0.004 | HIGH |
| 42406 | 3.039 | 0.006 | 0.033 | 0.000 | HIGH |
| 42407 | 3.521 | 0.007 | 0.301 | 0.002 | HIGH |
| 42408 | 1.892 | 0.004 | 0.707 | 0.005 | HIGH |
| 42409 | -1.063 | 0.002 | 0.552 | 0.004 | HIGH |
| 42410 | 1.223 | 0.002 | 0.150 | 0.001 | HIGH |
| 42411 | 1.244 | 0.002 | 0.384 | 0.002 | HIGH |
| 42412 | 2.046 | 0.004 | 0.178 | 0.001 | HIGH |
| 42413 | 0.476 | 0.001 | 0.101 | 0.001 | HIGH |
| 42414 | 0.098 | 0.000 | 0.050 | 0.000 | HIGH |
| 42415 | -0.020 | 0.000 | 0.122 | 0.001 | HIGH |
| 42455 | -13.890 | 0.026 | 6.039 | 0.039 | HIGH |
| 42456 | -22.202 | 0.042 | 4.270 | 0.027 | HIGH |
| 43301 | -1.165 | 0.002 | 0.109 | 0.001 | HIGH |
| 43302 | 2.102 | 0.004 | 0.306 | 0.002 | HIGH |
| 43303 | 2.129 | 0.004 | 0.501 | 0.003 | HIGH |
| 43304 | -2.484 | 0.005 | 0.197 | 0.001 | HIGH |
| 43305 | -1.031 | 0.002 | 0.224 | 0.001 | HIGH |
| 43306 | -0.589 | 0.001 | 0.488 | 0.003 | HIGH |
| 43307 | -1.622 | 0.003 | 0.195 | 0.001 | HIGH |
| 43308 | 0.108 | 0.000 | 0.284 | 0.002 | HIGH |
| 43313 | -1.549 | 0.003 | 0.134 | 0.001 | HIGH |
| 43314 | -1.941 | 0.004 | 0.218 | 0.001 | HIGH |
| 43319 | -1.180 | 0.002 | 0.236 | 0.002 | HIGH |
| 43320 | -1.165 | 0.002 | 0.136 | 0.001 | HIGH |
| 43321 | -2.374 | 0.004 | 0.223 | 0.001 | HIGH |
| 43322 | -2.321 | 0.004 | 0.088 | 0.001 | HIGH |
| 43323 | -2.051 | 0.004 | 0.209 | 0.001 | HIGH |
| 43324 | -2.601 | 0.005 | 2.788 | 0.018 | HIGH |
| 43327 | 0.876 | 0.002 | 2.801 | 0.018 | HIGH |
| 43328 | 0.091 | 0.000 | 0.220 | 0.001 | HIGH |
| 43329 | -0.851 | 0.002 | 0.091 | 0.001 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43330 | -1.104 | 0.002 | 0.234 | 0.001 | HIGH |
| 43331 | -2.410 | 0.005 | 0.254 | 0.002 | HIGH |
| 43332 | -1.906 | 0.004 | 0.187 | 0.001 | HIGH |
| 43333 | -1.612 | 0.003 | 0.229 | 0.001 | HIGH |
| 43334 | -0.886 | 0.002 | 2.252 | 0.014 | HIGH |
| 43338 | -0.174 | 0.000 | 2.251 | 0.014 | HIGH |
| 43339 | -0.354 | 0.001 | 0.229 | 0.001 | HIGH |
| 43340 | -0.723 | 0.001 | 0.201 | 0.001 | HIGH |
| 43341 | -0.573 | 0.001 | 0.236 | 0.002 | HIGH |
| 43342 | -2.645 | 0.005 | 0.214 | 0.001 | HIGH |
| 43343 | -1.989 | 0.004 | 0.232 | 0.001 | HIGH |
| 43344 | -1.959 | 0.004 | 0.150 | 0.001 | HIGH |
| 43345 | -1.981 | 0.004 | 0.807 | 0.005 | HIGH |
| 43346 | 1.125 | 0.002 | 0.965 | 0.006 | HIGH |
| 43349 | -0.727 | 0.001 | 0.977 | 0.006 | HIGH |
| 43350 | 0.244 | 0.000 | 0.798 | 0.005 | HIGH |
| 43351 | -0.064 | 0.000 | 0.169 | 0.001 | HIGH |
| 43352 | -0.221 | 0.000 | 0.232 | 0.001 | HIGH |
| 43353 | 0.062 | 0.000 | 0.221 | 0.001 | HIGH |
| 43354 | -3.471 | 0.007 | 0.196 | 0.001 | HIGH |
| 43355 | -2.281 | 0.004 | 0.196 | 0.001 | HIGH |
| 43356 | -1.934 | 0.004 | 0.151 | 0.001 | HIGH |
| 43357 | -1.684 | 0.003 | 0.294 | 0.002 | HIGH |
| 43358 | -1.221 | 0.002 | 0.797 | 0.005 | HIGH |
| 43359 | -1.225 | 0.002 | 0.870 | 0.006 | HIGH |
| 43360 | -0.073 | 0.000 | 0.302 | 0.002 | HIGH |
| 43361 | 1.320 | 0.002 | 0.891 | 0.006 | HIGH |
| 43362 | 0.296 | 0.001 | 0.790 | 0.005 | HIGH |
| 43363 | 0.277 | 0.001 | 0.272 | 0.002 | HIGH |
| 43364 | 0.262 | 0.000 | 0.167 | 0.001 | HIGH |
| 43365 | 0.441 | 0.001 | 0.175 | 0.001 | HIGH |
| 43366 | 1.156 | 0.002 | 0.179 | 0.001 | HIGH |
| 43367 | -4.087 | 0.008 | 0.131 | 0.001 | HIGH |
| 43368 | -2.677 | 0.005 | 0.133 | 0.001 | HIGH |
| 43369 | -1.881 | 0.004 | 0.097 | 0.001 | HIGH |
| 43370 | -1.306 | 0.002 | 0.076 | 0.000 | HIGH |
| 43371 | -0.806 | 0.002 | 0.292 | 0.002 | HIGH |
| 43372 | -0.624 | 0.001 | 0.361 | 0.002 | HIGH |
| 43373 | -0.316 | 0.001 | 0.328 | 0.002 | HIGH |
| 43374 | 0.399 | 0.001 | 0.340 | 0.002 | HIGH |
| 43375 | 0.372 | 0.001 | 0.367 | 0.002 | HIGH |
| 43376 | 0.188 | 0.000 | 0.274 | 0.002 | HIGH |
| 43377 | 0.346 | 0.001 | 0.078 | 0.001 | HIGH |
| 43378 | 0.686 | 0.001 | 0.109 | 0.001 | HIGH |
| 43379 | 1.185 | 0.002 | 0.107 | 0.001 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43380 | 2.159 | 0.004 | 0.082 | 0.001 | HIGH |
| 43382 | -2.309 | 0.004 | 0.179 | 0.001 | HIGH |
| 43383 | -1.429 | 0.003 | 0.028 | 0.000 | HIGH |
| 43384 | -0.786 | 0.001 | 0.032 | 0.000 | HIGH |
| 43385 | -0.392 | 0.001 | 0.054 | 0.000 | HIGH |
| 43386 | -0.222 | 0.000 | 0.095 | 0.001 | HIGH |
| 43387 | -0.105 | 0.000 | 0.111 | 0.001 | HIGH |
| 43388 | 0.124 | 0.000 | 0.081 | 0.001 | HIGH |
| 43389 | 0.237 | 0.000 | 0.109 | 0.001 | HIGH |
| 43390 | 0.160 | 0.000 | 0.087 | 0.001 | HIGH |
| 43391 | 0.183 | 0.000 | 0.044 | 0.000 | HIGH |
| 43392 | 0.523 | 0.001 | 0.047 | 0.000 | HIGH |
| 43393 | 1.086 | 0.002 | 0.039 | 0.000 | HIGH |
| 43394 | 1.800 | 0.003 | 0.041 | 0.000 | HIGH |
| 43397 | 0.840 | 0.002 | 0.248 | 0.002 | HIGH |
| 43398 | -0.290 | 0.001 | 0.075 | 0.000 | HIGH |
| 43399 | -0.786 | 0.001 | 0.026 | 0.000 | HIGH |
| 43400 | -0.718 | 0.001 | 0.136 | 0.001 | HIGH |
| 43401 | -0.493 | 0.001 | 0.221 | 0.001 | HIGH |
| 43402 | 0.152 | 0.000 | 0.220 | 0.001 | HIGH |
| 43403 | 1.681 | 0.003 | 0.407 | 0.003 | HIGH |
| 43406 | 0.828 | 0.002 | 0.244 | 0.002 | HIGH |
| 43407 | -0.011 | 0.000 | 0.204 | 0.001 | HIGH |
| 43408 | -0.791 | 0.001 | 0.161 | 0.001 | HIGH |
| 43409 | -1.124 | 0.002 | 0.137 | 0.001 | HIGH |
| 43410 | -1.144 | 0.002 | 0.384 | 0.002 | HIGH |
| 43411 | -1.426 | 0.003 | 0.461 | 0.003 | HIGH |
| 43412 | -1.358 | 0.003 | 0.503 | 0.003 | HIGH |
| 43413 | 0.047 | 0.000 | 1.380 | 0.009 | HIGH |
| 43415 | -0.166 | 0.000 | 0.318 | 0.002 | HIGH |
| 43416 | -0.873 | 0.002 | 0.306 | 0.002 | HIGH |
| 43417 | -1.432 | 0.003 | 0.214 | 0.001 | HIGH |
| 43418 | -1.668 | 0.003 | 0.300 | 0.002 | HIGH |
| 43419 | -1.635 | 0.003 | 0.666 | 0.004 | HIGH |
| 43420 | -2.484 | 0.005 | 0.781 | 0.005 | HIGH |
| 43421 | -2.278 | 0.004 | 1.405 | 0.009 | HIGH |
| 43424 | -1.271 | 0.002 | 0.419 | 0.003 | HIGH |
| 43425 | -1.816 | 0.003 | 0.404 | 0.003 | HIGH |
| 43426 | -2.297 | 0.004 | 0.191 | 0.001 | HIGH |
| 43427 | -2.745 | 0.005 | 0.528 | 0.003 | HIGH |
| 43428 | -4.906 | 0.009 | 1.688 | 0.011 | HIGH |
| 43430 | -2.068 | 0.004 | 2.705 | 0.017 | HIGH |
| 43432 | -2.012 | 0.004 | 0.638 | 0.004 | HIGH |
| 43433 | -2.396 | 0.005 | 0.385 | 0.002 | HIGH |
| 43434 | -2.565 | 0.005 | 0.465 | 0.003 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43435 | -2.257 | 0.004 | 2.108 | 0.013 | HIGH |
| 43438 | -3.271 | 0.006 | 2.602 | 0.017 | HIGH |
| 43440 | -2.328 | 0.004 | 0.729 | 0.005 | HIGH |
| 43441 | -2.693 | 0.005 | 0.330 | 0.002 | HIGH |
| 43442 | -2.984 | 0.006 | 0.612 | 0.004 | HIGH |
| 43443 | -3.509 | 0.007 | 0.614 | 0.004 | HIGH |
| 43446 | -1.565 | 0.003 | 4.145 | 0.026 | HIGH |
| 43450 | -2.323 | 0.004 | 0.500 | 0.003 | HIGH |
| 43451 | -2.802 | 0.005 | 0.527 | 0.003 | HIGH |
| 43452 | -3.497 | 0.007 | 0.529 | 0.003 | HIGH |
| 43453 | -2.767 | 0.005 | 0.492 | 0.003 | HIGH |
| 43455 | -2.799 | 0.005 | 1.624 | 0.010 | HIGH |
| 43456 | -1.996 | 0.004 | 0.938 | 0.006 | HIGH |
| 43457 | -2.771 | 0.005 | 1.202 | 0.008 | HIGH |
| 43459 | -2.016 | 0.004 | 0.477 | 0.003 | HIGH |
| 43460 | -2.365 | 0.004 | 0.465 | 0.003 | HIGH |
| 43461 | -2.357 | 0.004 | 0.453 | 0.003 | HIGH |
| 43462 | -1.303 | 0.002 | 0.487 | 0.003 | HIGH |
| 43463 | -1.752 | 0.003 | 0.838 | 0.005 | HIGH |
| 43464 | -1.577 | 0.003 | 0.620 | 0.004 | HIGH |
| 43465 | -0.736 | 0.001 | 0.519 | 0.003 | HIGH |
| 43467 | -1.425 | 0.003 | 0.493 | 0.003 | HIGH |
| 43468 | -1.545 | 0.003 | 0.472 | 0.003 | HIGH |
| 43469 | -1.311 | 0.002 | 0.396 | 0.003 | HIGH |
| 43470 | -1.275 | 0.002 | 0.563 | 0.004 | HIGH |
| 43471 | -0.953 | 0.002 | 0.547 | 0.003 | HIGH |
| 43472 | -0.570 | 0.001 | 0.244 | 0.002 | HIGH |
| 43473 | -0.416 | 0.001 | 0.343 | 0.002 | HIGH |
| 43474 | -0.511 | 0.001 | 0.782 | 0.005 | HIGH |
| 43475 | -0.643 | 0.001 | 0.337 | 0.002 | HIGH |
| 43476 | -0.782 | 0.001 | 0.336 | 0.002 | HIGH |
| 43477 | -0.749 | 0.001 | 0.337 | 0.002 | HIGH |
| 43478 | -0.575 | 0.001 | 0.282 | 0.002 | HIGH |
| 43479 | -0.675 | 0.001 | 0.358 | 0.002 | HIGH |
| 43480 | 0.268 | 0.001 | 0.784 | 0.005 | HIGH |
| 43481 | -0.067 | 0.000 | 0.222 | 0.001 | HIGH |
| 43482 | -0.386 | 0.001 | 0.211 | 0.001 | HIGH |
| 43483 | -0.545 | 0.001 | 0.211 | 0.001 | HIGH |
| 43484 | -0.718 | 0.001 | 0.184 | 0.001 | HIGH |
| 43485 | 0.653 | 0.001 | 0.580 | 0.004 | HIGH |
| 43486 | 0.204 | 0.000 | 0.162 | 0.001 | HIGH |
| 43487 | -0.273 | 0.001 | 0.103 | 0.001 | HIGH |
| 43488 | -0.769 | 0.001 | 0.081 | 0.001 | HIGH |
| 43489 | 1.055 | 0.002 | 0.402 | 0.003 | HIGH |
| 43490 | 0.537 | 0.001 | 0.129 | 0.001 | HIGH |

S.S.-242

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43491 | -0.189 | 0.000 | 0.108 | 0.001 | HIGH |
| 43492 | 3.264 | 0.006 | 0.318 | 0.002 | HIGH |
| 43499 | -1.497 | 0.003 | 0.315 | 0.002 | HIGH |
| 43500 | -0.954 | 0.002 | 0.221 | 0.001 | HIGH |
| 43501 | -0.526 | 0.001 | 0.219 | 0.001 | HIGH |
| 43502 | -0.414 | 0.001 | 0.125 | 0.001 | HIGH |
| 43503 | -0.460 | 0.001 | 0.045 | 0.000 | HIGH |
| 43504 | -0.989 | 0.002 | 0.093 | 0.001 | HIGH |
| 43505 | -2.040 | 0.004 | 0.160 | 0.001 | HIGH |
| 43509 | -1.772 | 0.003 | 0.525 | 0.003 | HIGH |
| 43510 | -0.832 | 0.002 | 0.483 | 0.003 | HIGH |
| 43511 | -0.455 | 0.001 | 0.375 | 0.002 | HIGH |
| 43512 | -0.287 | 0.001 | 0.115 | 0.001 | HIGH |
| 43513 | -0.453 | 0.001 | 0.196 | 0.001 | HIGH |
| 43514 | -0.938 | 0.002 | 0.217 | 0.001 | HIGH |
| 43515 | -1.484 | 0.003 | 0.218 | 0.001 | HIGH |
| 43518 | -1.116 | 0.002 | 1.243 | 0.008 | HIGH |
| 43519 | -0.513 | 0.001 | 0.779 | 0.005 | HIGH |
| 43520 | -0.295 | 0.001 | 0.668 | 0.004 | HIGH |
| 43521 | 0.023 | 0.000 | 0.277 | 0.002 | HIGH |
| 43522 | 0.051 | 0.000 | 0.272 | 0.002 | HIGH |
| 43523 | -0.274 | 0.001 | 0.376 | 0.002 | HIGH |
| 43524 | -0.734 | 0.001 | 0.390 | 0.002 | HIGH |
| 43526 | -0.306 | 0.001 | 2.590 | 0.017 | HIGH |
| 43528 | 1.374 | 0.003 | 1.709 | 0.011 | HIGH |
| 43529 | 0.716 | 0.001 | 0.513 | 0.003 | HIGH |
| 43530 | 0.749 | 0.001 | 0.258 | 0.002 | HIGH |
| 43531 | 0.606 | 0.001 | 0.514 | 0.003 | HIGH |
| 43532 | 0.293 | 0.001 | 0.538 | 0.003 | HIGH |
| 43534 | 0.414 | 0.001 | 2.404 | 0.015 | HIGH |
| 43537 | -0.009 | 0.000 | 2.089 | 0.013 | HIGH |
| 43538 | 1.118 | 0.002 | 0.456 | 0.003 | HIGH |
| 43539 | 1.332 | 0.003 | 0.507 | 0.003 | HIGH |
| 43540 | 1.230 | 0.002 | 0.858 | 0.005 | HIGH |
| 43544 | 0.594 | 0.001 | 4.072 | 0.026 | HIGH |
| 43547 | 2.673 | 0.005 | 0.601 | 0.004 | HIGH |
| 43548 | 1.925 | 0.004 | 0.586 | 0.004 | HIGH |
| 43549 | 1.894 | 0.004 | 0.266 | 0.002 | HIGH |
| 43550 | 1.790 | 0.003 | 0.955 | 0.006 | HIGH |
| 43553 | 2.742 | 0.005 | 0.999 | 0.006 | HIGH |
| 43554 | 3.742 | 0.007 | 1.639 | 0.010 | HIGH |
| 43556 | 1.483 | 0.003 | 0.503 | 0.003 | HIGH |
| 43557 | 3.010 | 0.006 | 0.465 | 0.003 | HIGH |
| 43558 | 2.315 | 0.004 | 0.462 | 0.003 | HIGH |
| 43559 | 1.964 | 0.004 | 0.632 | 0.004 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 43561 | 3.611 | 0.007 | 0.546 | 0.003 | HIGH |
| 43562 | 3.590 | 0.007 | 0.593 | 0.004 | HIGH |
| 43563 | 2.976 | 0.006 | 0.848 | 0.005 | HIGH |
| 43564 | 1.938 | 0.004 | 0.483 | 0.003 | HIGH |
| 43565 | 2.773 | 0.005 | 0.368 | 0.002 | HIGH |
| 43566 | 2.484 | 0.005 | 0.381 | 0.002 | HIGH |
| 43567 | 1.989 | 0.004 | 0.386 | 0.002 | HIGH |
| 43568 | 2.720 | 0.005 | 0.326 | 0.002 | HIGH |
| 43569 | 3.179 | 0.006 | 0.280 | 0.002 | HIGH |
| 43570 | 2.902 | 0.005 | 0.544 | 0.003 | HIGH |
| 43571 | 2.940 | 0.006 | 0.560 | 0.004 | HIGH |
| 43572 | 2.496 | 0.005 | 0.442 | 0.003 | HIGH |
| 43573 | 2.331 | 0.004 | 0.360 | 0.002 | HIGH |
| 43574 | 1.950 | 0.004 | 0.427 | 0.003 | HIGH |
| 43575 | 2.774 | 0.005 | 0.374 | 0.002 | HIGH |
| 43576 | 2.817 | 0.005 | 0.265 | 0.002 | HIGH |
| 43577 | 2.803 | 0.005 | 0.361 | 0.002 | HIGH |
| 43578 | 2.572 | 0.005 | 0.361 | 0.002 | HIGH |
| 43579 | 2.095 | 0.004 | 0.202 | 0.001 | HIGH |
| 43580 | 1.700 | 0.003 | 0.619 | 0.004 | HIGH |
| 43581 | 2.796 | 0.005 | 0.224 | 0.001 | HIGH |
| 43582 | 2.727 | 0.005 | 0.214 | 0.001 | HIGH |
| 43583 | 2.399 | 0.005 | 0.214 | 0.001 | HIGH |
| 43584 | 1.846 | 0.003 | 0.166 | 0.001 | HIGH |
| 43585 | 1.309 | 0.002 | 0.543 | 0.003 | HIGH |
| 43586 | 2.795 | 0.005 | 0.060 | 0.000 | HIGH |
| 43587 | 2.278 | 0.004 | 0.085 | 0.001 | HIGH |
| 43588 | 1.505 | 0.003 | 0.074 | 0.000 | HIGH |
| 43589 | 0.837 | 0.002 | 0.336 | 0.002 | HIGH |
| 43590 | 1.691 | 0.003 | 0.063 | 0.000 | HIGH |
| 43591 | 0.890 | 0.002 | 0.061 | 0.000 | HIGH |
| 43592 | 0.103 | 0.000 | 0.142 | 0.001 | HIGH |
| 43594 | -2.036 | 0.004 | 0.182 | 0.001 | HIGH |
| 52201 | 0.109 | 0.000 | 1.101 | 0.007 | HIGH |
| 52202 | -5.588 | 0.011 | 0.498 | 0.003 | HIGH |
| 52204 | 1.577 | 0.003 | 0.111 | 0.001 | HIGH |
| 52205 | 2.202 | 0.004 | 0.046 | 0.000 | HIGH |
| 52206 | -2.552 | 0.005 | 0.091 | 0.001 | HIGH |
| 52207 | 5.875 | 0.011 | 0.717 | 0.005 | HIGH |
| 52208 | -4.585 | 0.009 | 0.295 | 0.002 | HIGH |
| 52215 | 0.623 | 0.001 | 2.957 | 0.019 | HIGH |
| 52216 | -0.229 | 0.000 | 0.741 | 0.005 | HIGH |
| 52222 | 6.771 | 0.013 | 0.167 | 0.001 | HIGH |
| 52223 | 8.064 | 0.015 | 0.969 | 0.006 | HIGH |
| 52224 | -0.189 | 0.000 | 3.990 | 0.025 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52225 | 0.250 | 0.000 | 1.678 | 0.011 | HIGH |
| 52226 | 1.418 | 0.003 | 0.101 | 0.001 | HIGH |
| 52227 | 2.877 | 0.005 | 0.035 | 0.000 | HIGH |
| 52228 | 2.462 | 0.005 | 0.075 | 0.000 | HIGH |
| 52229 | 2.083 | 0.004 | 0.091 | 0.001 | HIGH |
| 52230 | 3.775 | 0.007 | 0.807 | 0.005 | HIGH |
| 52231 | 5.895 | 0.011 | 1.254 | 0.008 | HIGH |
| 52232 | 6.560 | 0.012 | 0.995 | 0.006 | HIGH |
| 52233 | 3.615 | 0.007 | 2.261 | 0.014 | HIGH |
| 52234 | -0.221 | 0.000 | 2.473 | 0.016 | HIGH |
| 52235 | 0.259 | 0.000 | 1.714 | 0.011 | HIGH |
| 52236 | 1.042 | 0.002 | 0.108 | 0.001 | HIGH |
| 52237 | 1.360 | 0.003 | 0.071 | 0.000 | HIGH |
| 52238 | 3.072 | 0.006 | 0.107 | 0.001 | HIGH |
| 52239 | 3.668 | 0.007 | 0.246 | 0.002 | HIGH |
| 52240 | 5.331 | 0.010 | 0.351 | 0.002 | HIGH |
| 52241 | 1.409 | 0.003 | 7.791 | 0.050 | HIGH |
| 52242 | 1.972 | 0.004 | 27.843 | 0.178 | HIGH |
| 52243 | 0.566 | 0.001 | 0.127 | 0.001 | HIGH |
| 52244 | 2.396 | 0.005 | 28.402 | 0.181 | HIGH |
| 52245 | -0.377 | 0.001 | 0.962 | 0.006 | HIGH |
| 52246 | -0.069 | 0.000 | 1.013 | 0.006 | HIGH |
| 52247 | 1.329 | 0.003 | 0.053 | 0.000 | HIGH |
| 52248 | 0.974 | 0.002 | 0.037 | 0.000 | HIGH |
| 52249 | 2.041 | 0.004 | 0.084 | 0.001 | HIGH |
| 52250 | 3.193 | 0.006 | 0.201 | 0.001 | HIGH |
| 52251 | 3.029 | 0.006 | 1.196 | 0.008 | HIGH |
| 52252 | 1.621 | 0.003 | 3.673 | 0.023 | HIGH |
| 52253 | 2.034 | 0.004 | 3.722 | 0.024 | HIGH |
| 52254 | 2.182 | 0.004 | 14.365 | 0.092 | HIGH |
| 52255 | -3.988 | 0.008 | 16.949 | 0.108 | HIGH |
| 52256 | -3.767 | 0.007 | 2.833 | 0.018 | HIGH |
| 52257 | -0.713 | 0.001 | 0.390 | 0.002 | HIGH |
| 52258 | 0.158 | 0.000 | 0.371 | 0.002 | HIGH |
| 52259 | -0.314 | 0.001 | 0.487 | 0.003 | HIGH |
| 52260 | 0.984 | 0.002 | 0.052 | 0.000 | HIGH |
| 52261 | 3.091 | 0.006 | 0.174 | 0.001 | HIGH |
| 52262 | 0.096 | 0.000 | 0.082 | 0.001 | HIGH |
| 52263 | 1.559 | 0.003 | 0.392 | 0.003 | HIGH |
| 52264 | 0.934 | 0.002 | 1.414 | 0.009 | HIGH |
| 52265 | 0.589 | 0.001 | 1.526 | 0.010 | HIGH |
| 52266 | -0.166 | 0.000 | 4.075 | 0.026 | HIGH |
| 52267 | -1.563 | 0.003 | 7.028 | 0.045 | HIGH |
| 52268 | -1.649 | 0.003 | 3.648 | 0.023 | HIGH |
| 52269 | -2.760 | 0.005 | 1.431 | 0.009 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52270 | 2.460 | 0.005 | 0.166 | 0.001 | HIGH |
| 52271 | 1.905 | 0.004 | 0.084 | 0.001 | HIGH |
| 52272 | 1.765 | 0.003 | 0.246 | 0.002 | HIGH |
| 52273 | 1.822 | 0.003 | 0.187 | 0.001 | HIGH |
| 52274 | 1.370 | 0.003 | 0.149 | 0.001 | HIGH |
| 52275 | -4.672 | 0.009 | 0.288 | 0.002 | HIGH |
| 52278 | 2.015 | 0.004 | 0.073 | 0.000 | HIGH |
| 52279 | 2.995 | 0.006 | 0.150 | 0.001 | HIGH |
| 52280 | 0.062 | 0.000 | 0.008 | 0.000 | HIGH |
| 52281 | 3.062 | 0.006 | 0.046 | 0.000 | HIGH |
| 52282 | 1.383 | 0.003 | 0.057 | 0.000 | HIGH |
| 52283 | -0.738 | 0.001 | 0.397 | 0.003 | HIGH |
| 52286 | 3.850 | 0.007 | 0.266 | 0.002 | HIGH |
| 52287 | 3.277 | 0.006 | 0.013 | 0.000 | HIGH |
| 52288 | 2.771 | 0.005 | 0.013 | 0.000 | HIGH |
| 52289 | 2.741 | 0.005 | 0.014 | 0.000 | HIGH |
| 52290 | 3.344 | 0.006 | 0.087 | 0.001 | HIGH |
| 52293 | 2.948 | 0.006 | 0.354 | 0.002 | HIGH |
| 52294 | 4.025 | 0.008 | 0.057 | 0.000 | HIGH |
| 52295 | 0.136 | 0.000 | 0.008 | 0.000 | HIGH |
| 52296 | 5.735 | 0.011 | 0.021 | 0.000 | HIGH |
| 52297 | 6.477 | 0.012 | 0.056 | 0.000 | HIGH |
| 52300 | 5.102 | 0.010 | 0.401 | 0.003 | HIGH |
| 52301 | 5.272 | 0.010 | 0.021 | 0.000 | HIGH |
| 52302 | 6.193 | 0.012 | 0.053 | 0.000 | HIGH |
| 52303 | 5.668 | 0.011 | 0.050 | 0.000 | HIGH |
| 52304 | 6.038 | 0.011 | 0.076 | 0.000 | HIGH |
| 52308 | 8.206 | 0.015 | 0.259 | 0.002 | HIGH |
| 52309 | 6.751 | 0.013 | 0.122 | 0.001 | HIGH |
| 52310 | 6.940 | 0.013 | 0.190 | 0.001 | HIGH |
| 52311 | 5.308 | 0.010 | 0.184 | 0.001 | HIGH |
| 52312 | 3.024 | 0.006 | 0.071 | 0.000 | HIGH |
| 52316 | 8.137 | 0.015 | 0.419 | 0.003 | HIGH |
| 52317 | 8.884 | 0.017 | 0.414 | 0.003 | HIGH |
| 52318 | 10.319 | 0.019 | 0.855 | 0.005 | HIGH |
| 52319 | 1.536 | 0.003 | 1.341 | 0.009 | HIGH |
| 52320 | -0.603 | 0.001 | 0.742 | 0.005 | HIGH |
| 52323 | 8.262 | 0.016 | 1.777 | 0.011 | HIGH |
| 52324 | 8.712 | 0.016 | 1.533 | 0.010 | HIGH |
| 52325 | 8.310 | 0.016 | 5.320 | 0.034 | HIGH |
| 52326 | 7.800 | 0.015 | 14.354 | 0.092 | HIGH |
| 52327 | -6.689 | 0.013 | 0.559 | 0.004 | HIGH |
| 52329 | 7.977 | 0.015 | 4.011 | 0.026 | HIGH |
| 52330 | 8.634 | 0.017 | 4.955 | 0.032 | HIGH |
| 52331 | 8.711 | 0.016 | 14.499 | 0.093 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52332 | 2.552 | 0.005 | 16.832 | 0.107 | HIGH |
| 52333 | 4.692 | 0.009 | 2.220 | 0.014 | HIGH |
| 52334 | 7.629 | 0.014 | 9.645 | 0.062 | HIGH |
| 52335 | 9.137 | 0.017 | 26.413 | 0.169 | HIGH |
| 52336 | 1.275 | 0.002 | 0.045 | 0.000 | HIGH |
| 52337 | 15.548 | 0.029 | 28.387 | 0.181 | HIGH |
| 52338 | 5.246 | 0.010 | 7.735 | 0.049 | HIGH |
| 52339 | 5.321 | 0.010 | 11.011 | 0.070 | HIGH |
| 52340 | 13.092 | 0.025 | 2.355 | 0.015 | HIGH |
| 52341 | 3.177 | 0.006 | 0.362 | 0.002 | HIGH |
| 52342 | 4.514 | 0.009 | 0.940 | 0.006 | HIGH |
| 52343 | 0.056 | 0.000 | 0.376 | 0.002 | HIGH |
| 52346 | -1.788 | 0.003 | 0.044 | 0.000 | HIGH |
| 52347 | 1.897 | 0.004 | 0.293 | 0.002 | HIGH |
| 52348 | -1.946 | 0.004 | 6.868 | 0.044 | HIGH |
| 52349 | -3.598 | 0.007 | 8.799 | 0.056 | HIGH |
| 52350 | -3.148 | 0.006 | 2.258 | 0.014 | HIGH |
| 52351 | -1.931 | 0.004 | 0.404 | 0.003 | HIGH |
| 52353 | 0.039 | 0.000 | 0.120 | 0.001 | HIGH |
| 52354 | -3.113 | 0.006 | 0.229 | 0.001 | HIGH |
| 52355 | -1.722 | 0.003 | 27.263 | 0.174 | HIGH |
| 52356 | -0.698 | 0.001 | 0.044 | 0.000 | HIGH |
| 52357 | -3.173 | 0.006 | 16.977 | 0.108 | HIGH |
| 52358 | -3.036 | 0.006 | 4.608 | 0.029 | HIGH |
| 52361 | -1.863 | 0.004 | 1.899 | 0.012 | HIGH |
| 52362 | -4.039 | 0.008 | 4.796 | 0.031 | HIGH |
| 52363 | -4.585 | 0.009 | 6.644 | 0.042 | HIGH |
| 52364 | -4.714 | 0.009 | 6.132 | 0.039 | HIGH |
| 52365 | -3.230 | 0.006 | 10.259 | 0.066 | HIGH |
| 52368 | -5.137 | 0.010 | 0.131 | 0.001 | HIGH |
| 52369 | -6.966 | 0.013 | 0.103 | 0.001 | HIGH |
| 52370 | -5.658 | 0.011 | 7.449 | 0.048 | HIGH |
| 52371 | -6.056 | 0.011 | 3.606 | 0.023 | HIGH |
| 52372 | -5.223 | 0.010 | 7.360 | 0.047 | HIGH |
| 52375 | -7.744 | 0.015 | 0.032 | 0.000 | HIGH |
| 52376 | -7.352 | 0.014 | 0.087 | 0.001 | HIGH |
| 52377 | -8.984 | 0.017 | 0.821 | 0.005 | HIGH |
| 52378 | -7.577 | 0.014 | 1.545 | 0.010 | HIGH |
| 52379 | -7.171 | 0.014 | 2.178 | 0.014 | HIGH |
| 52383 | -9.086 | 0.017 | 0.056 | 0.000 | HIGH |
| 52384 | -8.608 | 0.016 | 0.053 | 0.000 | HIGH |
| 52385 | -9.162 | 0.017 | 0.129 | 0.001 | HIGH |
| 52386 | -8.992 | 0.017 | 0.194 | 0.001 | HIGH |
| 52387 | -8.292 | 0.016 | 0.163 | 0.001 | HIGH |
| 52390 | -7.361 | 0.014 | 0.051 | 0.000 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 52391 | -6.699 | 0.013 | 0.043 | 0.000 | HIGH |
| 52392 | -9.144 | 0.017 | 0.092 | 0.001 | HIGH |
| 52393 | -9.546 | 0.018 | 0.055 | 0.000 | HIGH |
| 52394 | -8.093 | 0.015 | 0.129 | 0.001 | HIGH |
| 52396 | -7.809 | 0.015 | 0.608 | 0.004 | HIGH |
| 52397 | -6.835 | 0.013 | 0.049 | 0.000 | HIGH |
| 52398 | -7.025 | 0.013 | 0.045 | 0.000 | HIGH |
| 52399 | -6.501 | 0.012 | 0.080 | 0.001 | HIGH |
| 52400 | -8.490 | 0.016 | 0.178 | 0.001 | HIGH |
| 52401 | -6.787 | 0.013 | 1.807 | 0.012 | HIGH |
| 52402 | -6.538 | 0.012 | 0.979 | 0.006 | HIGH |
| 52403 | -7.045 | 0.013 | 0.079 | 0.001 | HIGH |
| 52404 | -7.404 | 0.014 | 0.049 | 0.000 | HIGH |
| 52405 | -4.052 | 0.008 | 1.123 | 0.007 | HIGH |
| 52406 | -6.220 | 0.012 | 3.356 | 0.021 | HIGH |
| 52407 | -6.258 | 0.012 | 0.962 | 0.006 | HIGH |
| 52408 | -6.641 | 0.013 | 0.053 | 0.000 | HIGH |
| 52409 | -7.284 | 0.014 | 0.296 | 0.002 | HIGH |
| 52410 | -5.500 | 0.010 | 2.960 | 0.019 | HIGH |
| 52411 | -5.679 | 0.011 | 0.380 | 0.002 | HIGH |
| 52412 | -5.356 | 0.010 | 0.318 | 0.002 | HIGH |
| 52413 | -4.247 | 0.008 | 1.300 | 0.008 | HIGH |
| 52414 | -4.817 | 0.009 | 0.202 | 0.001 | HIGH |
| 52415 | -2.192 | 0.004 | 0.299 | 0.002 | HIGH |
| 52425 | 0.787 | 0.001 | 0.337 | 0.002 | HIGH |
| 52426 | -6.220 | 0.012 | 0.111 | 0.001 | HIGH |
| 52427 | 0.467 | 0.001 | 0.169 | 0.001 | HIGH |
| 52443 | 0.991 | 0.002 | 0.050 | 0.000 | HIGH |
| 52444 | 0.674 | 0.001 | 0.077 | 0.000 | HIGH |
| 52445 | -7.259 | 0.014 | 0.102 | 0.001 | HIGH |
| 52446 | 0.201 | 0.000 | 0.208 | 0.001 | HIGH |
| 52447 | -2.920 | 0.006 | 0.909 | 0.006 | HIGH |
| 52463 | -6.900 | 0.013 | 0.180 | 0.001 | HIGH |
| 52464 | 4.685 | 0.009 | 0.444 | 0.003 | HIGH |
| 52465 | -4.601 | 0.009 | 0.291 | 0.002 | HIGH |
| 53301 | 0.757 | 0.001 | 0.160 | 0.001 | HIGH |
| 53302 | -3.228 | 0.006 | 0.063 | 0.000 | HIGH |
| 53303 | -3.874 | 0.007 | 0.035 | 0.000 | HIGH |
| 53304 | 3.247 | 0.006 | 0.082 | 0.001 | HIGH |
| 53305 | -4.472 | 0.008 | 0.083 | 0.001 | HIGH |
| 53306 | 4.130 | 0.008 | 0.032 | 0.000 | HIGH |
| 53307 | -2.109 | 0.004 | 0.050 | 0.000 | HIGH |
| 53308 | 4.346 | 0.008 | 0.039 | 0.000 | HIGH |
| 53313 | 1.665 | 0.003 | 0.274 | 0.002 | HIGH |
| 53314 | 2.046 | 0.004 | 0.059 | 0.000 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53319 | -3.455 | 0.007 | 0.046 | 0.000 | HIGH |
| 53320 | -3.321 | 0.006 | 0.025 | 0.000 | HIGH |
| 53321 | 2.504 | 0.005 | 0.280 | 0.002 | HIGH |
| 53322 | 2.688 | 0.005 | 0.087 | 0.001 | HIGH |
| 53323 | 2.440 | 0.005 | 0.103 | 0.001 | HIGH |
| 53324 | -2.282 | 0.004 | 0.115 | 0.001 | HIGH |
| 53327 | 1.312 | 0.002 | 0.087 | 0.001 | HIGH |
| 53328 | -3.138 | 0.006 | 0.068 | 0.000 | HIGH |
| 53329 | -4.305 | 0.008 | 0.054 | 0.000 | HIGH |
| 53330 | -4.606 | 0.009 | 0.048 | 0.000 | HIGH |
| 53331 | 2.210 | 0.004 | 0.180 | 0.001 | HIGH |
| 53332 | 1.924 | 0.004 | 0.121 | 0.001 | HIGH |
| 53333 | 2.399 | 0.005 | 0.145 | 0.001 | HIGH |
| 53334 | -0.078 | 0.000 | 0.311 | 0.002 | HIGH |
| 53338 | -1.289 | 0.002 | 0.236 | 0.002 | HIGH |
| 53339 | -3.691 | 0.007 | 0.097 | 0.001 | HIGH |
| 53340 | -3.557 | 0.007 | 0.039 | 0.000 | HIGH |
| 53341 | -4.137 | 0.008 | 0.069 | 0.000 | HIGH |
| 53342 | 1.535 | 0.003 | 0.094 | 0.001 | HIGH |
| 53343 | 1.226 | 0.002 | 0.109 | 0.001 | HIGH |
| 53344 | 1.338 | 0.003 | 0.142 | 0.001 | HIGH |
| 53345 | 1.249 | 0.002 | 0.385 | 0.002 | HIGH |
| 53350 | -2.215 | 0.004 | 0.267 | 0.002 | HIGH |
| 53351 | -2.358 | 0.004 | 0.110 | 0.001 | HIGH |
| 53352 | -2.628 | 0.005 | 0.044 | 0.000 | HIGH |
| 53353 | -3.465 | 0.007 | 0.068 | 0.000 | HIGH |
| 53354 | 0.218 | 0.000 | 0.046 | 0.000 | HIGH |
| 53355 | 0.610 | 0.001 | 0.058 | 0.000 | HIGH |
| 53356 | 0.974 | 0.002 | 0.064 | 0.000 | HIGH |
| 53357 | 0.587 | 0.001 | 0.249 | 0.002 | HIGH |
| 53363 | -0.743 | 0.001 | 0.213 | 0.001 | HIGH |
| 53364 | -1.630 | 0.003 | 0.044 | 0.000 | HIGH |
| 53365 | -2.021 | 0.004 | 0.047 | 0.000 | HIGH |
| 53366 | -2.779 | 0.005 | 0.045 | 0.000 | HIGH |
| 53367 | -1.189 | 0.002 | 0.090 | 0.001 | HIGH |
| 53368 | 0.030 | 0.000 | 0.037 | 0.000 | HIGH |
| 53369 | 0.727 | 0.001 | 0.033 | 0.000 | HIGH |
| 53370 | 1.014 | 0.002 | 0.096 | 0.001 | HIGH |
| 53371 | -0.018 | 0.000 | 0.122 | 0.001 | HIGH |
| 53376 | 0.869 | 0.002 | 0.173 | 0.001 | HIGH |
| 53377 | -0.687 | 0.001 | 0.053 | 0.000 | HIGH |
| 53378 | -1.233 | 0.002 | 0.024 | 0.000 | HIGH |
| 53379 | -1.506 | 0.003 | 0.029 | 0.000 | HIGH |
| 53380 | -2.074 | 0.004 | 0.031 | 0.000 | HIGH |
| 53382 | 0.275 | 0.001 | 0.054 | 0.000 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53383 | 0.541 | 0.001 | 0.018 | 0.000 | HIGH |
| 53384 | 0.859 | 0.002 | 0.024 | 0.000 | HIGH |
| 53385 | 0.827 | 0.002 | 0.043 | 0.000 | HIGH |
| 53386 | 0.723 | 0.001 | 0.070 | 0.000 | HIGH |
| 53390 | 0.497 | 0.001 | 0.113 | 0.001 | HIGH |
| 53391 | 0.271 | 0.001 | 0.012 | 0.000 | HIGH |
| 53392 | -0.394 | 0.001 | 0.009 | 0.000 | HIGH |
| 53393 | -0.647 | 0.001 | 0.010 | 0.000 | HIGH |
| 53394 | -0.880 | 0.002 | 0.008 | 0.000 | HIGH |
| 53395 | -1.205 | 0.002 | 0.021 | 0.000 | HIGH |
| 53397 | 3.709 | 0.007 | 0.164 | 0.001 | HIGH |
| 53398 | 2.009 | 0.004 | 0.022 | 0.000 | HIGH |
| 53399 | 1.078 | 0.002 | 0.008 | 0.000 | HIGH |
| 53400 | 0.649 | 0.001 | 0.024 | 0.000 | HIGH |
| 53401 | 0.026 | 0.000 | 0.035 | 0.000 | HIGH |
| 53402 | -1.160 | 0.002 | 0.025 | 0.000 | HIGH |
| 53403 | -3.737 | 0.007 | 0.139 | 0.001 | HIGH |
| 53406 | 2.413 | 0.005 | 0.063 | 0.000 | HIGH |
| 53407 | 2.471 | 0.005 | 0.050 | 0.000 | HIGH |
| 53408 | 1.788 | 0.003 | 0.016 | 0.000 | HIGH |
| 53409 | 1.438 | 0.003 | 0.002 | 0.000 | HIGH |
| 53410 | 1.337 | 0.003 | 0.019 | 0.000 | HIGH |
| 53411 | 0.875 | 0.002 | 0.031 | 0.000 | HIGH |
| 53412 | 0.645 | 0.001 | 0.072 | 0.000 | HIGH |
| 53413 | -2.663 | 0.005 | 0.078 | 0.000 | HIGH |
| 53415 | 2.125 | 0.004 | 0.032 | 0.000 | HIGH |
| 53416 | 2.168 | 0.004 | 0.029 | 0.000 | HIGH |
| 53417 | 1.896 | 0.004 | 0.019 | 0.000 | HIGH |
| 53418 | 2.293 | 0.004 | 0.046 | 0.000 | HIGH |
| 53419 | 2.391 | 0.005 | 0.061 | 0.000 | HIGH |
| 53420 | 2.286 | 0.004 | 0.068 | 0.000 | HIGH |
| 53421 | 4.094 | 0.008 | 0.076 | 0.000 | HIGH |
| 53424 | 1.584 | 0.003 | 0.059 | 0.000 | HIGH |
| 53425 | 1.965 | 0.004 | 0.057 | 0.000 | HIGH |
| 53426 | 3.005 | 0.006 | 0.089 | 0.001 | HIGH |
| 53432 | 0.191 | 0.000 | 0.119 | 0.001 | HIGH |
| 53433 | 0.589 | 0.001 | 0.113 | 0.001 | HIGH |
| 53440 | -1.487 | 0.003 | 0.227 | 0.001 | HIGH |
| 53450 | -0.877 | 0.002 | 0.778 | 0.005 | HIGH |
| 53455 | 2.795 | 0.005 | 0.214 | 0.001 | HIGH |
| 53456 | 5.653 | 0.011 | 0.035 | 0.000 | HIGH |
| 53457 | 0.991 | 0.002 | 0.061 | 0.000 | HIGH |
| 53463 | 5.501 | 0.010 | 0.112 | 0.001 | HIGH |
| 53464 | 6.048 | 0.011 | 0.101 | 0.001 | HIGH |
| 53465 | 6.833 | 0.013 | 0.052 | 0.000 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53467 | -0.363 | 0.001 | 0.328 | 0.002 | HIGH |
| 53470 | 5.309 | 0.010 | 0.114 | 0.001 | HIGH |
| 53471 | 5.471 | 0.010 | 0.109 | 0.001 | HIGH |
| 53472 | 5.353 | 0.010 | 0.030 | 0.000 | HIGH |
| 53473 | 4.809 | 0.009 | 0.060 | 0.000 | HIGH |
| 53474 | 0.332 | 0.001 | 0.271 | 0.002 | HIGH |
| 53475 | 1.406 | 0.003 | 0.044 | 0.000 | HIGH |
| 53476 | 2.972 | 0.006 | 0.071 | 0.000 | HIGH |
| 53477 | 3.873 | 0.007 | 0.069 | 0.000 | HIGH |
| 53478 | 4.159 | 0.008 | 0.047 | 0.000 | HIGH |
| 53479 | 3.945 | 0.007 | 0.065 | 0.000 | HIGH |
| 53480 | 1.303 | 0.002 | 0.194 | 0.001 | HIGH |
| 53481 | 2.158 | 0.004 | 0.047 | 0.000 | HIGH |
| 53482 | 2.720 | 0.005 | 0.048 | 0.000 | HIGH |
| 53483 | 3.127 | 0.006 | 0.046 | 0.000 | HIGH |
| 53484 | 3.283 | 0.006 | 0.058 | 0.000 | HIGH |
| 53485 | 1.602 | 0.003 | 0.113 | 0.001 | HIGH |
| 53486 | 2.006 | 0.004 | 0.029 | 0.000 | HIGH |
| 53487 | 2.298 | 0.004 | 0.028 | 0.000 | HIGH |
| 53488 | 2.520 | 0.005 | 0.048 | 0.000 | HIGH |
| 53489 | 1.306 | 0.002 | 0.055 | 0.000 | HIGH |
| 53490 | 1.621 | 0.003 | 0.005 | 0.000 | HIGH |
| 53491 | 1.799 | 0.003 | 0.037 | 0.000 | HIGH |
| 53492 | 0.987 | 0.002 | 0.024 | 0.000 | HIGH |
| 53493 | 1.110 | 0.002 | 0.017 | 0.000 | HIGH |
| 53494 | 0.260 | 0.000 | 0.020 | 0.000 | HIGH |
| 53499 | 3.489 | 0.007 | 0.052 | 0.000 | HIGH |
| 53500 | 0.951 | 0.002 | 0.030 | 0.000 | HIGH |
| 53501 | 0.091 | 0.000 | 0.028 | 0.000 | HIGH |
| 53502 | -0.293 | 0.001 | 0.023 | 0.000 | HIGH |
| 53503 | -0.258 | 0.000 | 0.014 | 0.000 | HIGH |
| 53504 | -0.126 | 0.000 | 0.024 | 0.000 | HIGH |
| 53505 | 0.011 | 0.000 | 0.022 | 0.000 | HIGH |
| 53506 | 0.147 | 0.000 | 0.007 | 0.000 | HIGH |
| 53509 | -1.888 | 0.004 | 0.038 | 0.000 | HIGH |
| 53510 | -1.313 | 0.002 | 0.050 | 0.000 | HIGH |
| 53511 | -1.436 | 0.003 | 0.052 | 0.000 | HIGH |
| 53512 | -1.157 | 0.002 | 0.035 | 0.000 | HIGH |
| 53513 | -0.757 | 0.001 | 0.038 | 0.000 | HIGH |
| 53514 | -0.473 | 0.001 | 0.041 | 0.000 | HIGH |
| 53515 | -0.109 | 0.000 | 0.042 | 0.000 | HIGH |
| 53518 | -4.510 | 0.009 | 0.120 | 0.001 | HIGH |
| 53519 | -2.515 | 0.005 | 0.079 | 0.001 | HIGH |
| 53520 | -2.815 | 0.005 | 0.065 | 0.000 | HIGH |
| 53521 | -2.664 | 0.005 | 0.060 | 0.000 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 53522 | -1.769 | 0.003 | 0.039 | 0.000 | HIGH |
| 53523 | -1.213 | 0.002 | 0.076 | 0.000 | HIGH |
| 53524 | -0.777 | 0.001 | 0.079 | 0.001 | HIGH |
| 53530 | -3.781 | 0.007 | 0.108 | 0.001 | HIGH |
| 53531 | -2.220 | 0.004 | 0.100 | 0.001 | HIGH |
| 53532 | -1.374 | 0.003 | 0.111 | 0.001 | HIGH |
| 53539 | -2.292 | 0.004 | 0.169 | 0.001 | HIGH |
| 53540 | -1.545 | 0.003 | 0.212 | 0.001 | HIGH |
| 53550 | -0.655 | 0.001 | 0.430 | 0.003 | HIGH |
| 53553 | -6.292 | 0.012 | 0.039 | 0.000 | HIGH |
| 53554 | -3.240 | 0.006 | 0.224 | 0.001 | HIGH |
| 53559 | 0.464 | 0.001 | 0.289 | 0.002 | HIGH |
| 53561 | -5.977 | 0.011 | 0.102 | 0.001 | HIGH |
| 53562 | -5.982 | 0.011 | 0.100 | 0.001 | HIGH |
| 53563 | -5.273 | 0.010 | 0.105 | 0.001 | HIGH |
| 53568 | -3.896 | 0.007 | 0.229 | 0.001 | HIGH |
| 53569 | -4.632 | 0.009 | 0.123 | 0.001 | HIGH |
| 53570 | -5.089 | 0.010 | 0.147 | 0.001 | HIGH |
| 53571 | -4.982 | 0.009 | 0.162 | 0.001 | HIGH |
| 53574 | -0.774 | 0.001 | 0.134 | 0.001 | HIGH |
| 53575 | -3.365 | 0.006 | 0.384 | 0.002 | HIGH |
| 53576 | -3.644 | 0.007 | 0.109 | 0.001 | HIGH |
| 53577 | -3.739 | 0.007 | 0.110 | 0.001 | HIGH |
| 53578 | -3.335 | 0.006 | 0.109 | 0.001 | HIGH |
| 53579 | -2.291 | 0.004 | 0.058 | 0.000 | HIGH |
| 53580 | -1.901 | 0.004 | 0.147 | 0.001 | HIGH |
| 53581 | -2.672 | 0.005 | 0.354 | 0.002 | HIGH |
| 53582 | -2.798 | 0.005 | 0.067 | 0.000 | HIGH |
| 53583 | -3.142 | 0.006 | 0.096 | 0.001 | HIGH |
| 53584 | -3.408 | 0.006 | 0.091 | 0.001 | HIGH |
| 53585 | -3.093 | 0.006 | 0.135 | 0.001 | HIGH |
| 53586 | -1.723 | 0.003 | 0.229 | 0.001 | HIGH |
| 53587 | -2.322 | 0.004 | 0.087 | 0.001 | HIGH |
| 53588 | -2.996 | 0.006 | 0.089 | 0.001 | HIGH |
| 53589 | -2.986 | 0.006 | 0.091 | 0.001 | HIGH |
| 53590 | -1.258 | 0.002 | 0.112 | 0.001 | HIGH |
| 53591 | -2.491 | 0.005 | 0.086 | 0.001 | HIGH |
| 53592 | -2.426 | 0.005 | 0.078 | 0.000 | HIGH |
| 53594 | -3.257 | 0.006 | 0.072 | 0.000 | HIGH |
| 62201 | -7.258 | 0.014 | 0.691 | 0.004 | HIGH |
| 62202 | 4.492 | 0.008 | 0.181 | 0.001 | HIGH |
| 62203 | 3.797 | 0.007 | 0.107 | 0.001 | HIGH |
| 62204 | -4.679 | 0.009 | 0.146 | 0.001 | HIGH |
| 62205 | -0.415 | 0.001 | 0.063 | 0.000 | HIGH |
| 62206 | 1.577 | 0.003 | 0.133 | 0.001 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62207 | 0.921 | 0.002 | 0.083 | 0.001 | HIGH |
| 62208 | 1.292 | 0.002 | 0.106 | 0.001 | HIGH |
| 62215 | -12.897 | 0.024 | 0.954 | 0.006 | HIGH |
| 62216 | -7.634 | 0.014 | 0.137 | 0.001 | HIGH |
| 62222 | 0.236 | 0.000 | 0.108 | 0.001 | HIGH |
| 62223 | 0.973 | 0.002 | 0.140 | 0.001 | HIGH |
| 62224 | -11.971 | 0.023 | 2.055 | 0.013 | HIGH |
| 62225 | -9.701 | 0.018 | 0.313 | 0.002 | HIGH |
| 62226 | -6.221 | 0.012 | 0.099 | 0.001 | HIGH |
| 62227 | -3.475 | 0.007 | 0.087 | 0.001 | HIGH |
| 62228 | -1.661 | 0.003 | 0.006 | 0.000 | HIGH |
| 62229 | -0.762 | 0.001 | 0.057 | 0.000 | HIGH |
| 62230 | -0.422 | 0.001 | 0.147 | 0.001 | HIGH |
| 62231 | -0.231 | 0.000 | 0.227 | 0.001 | HIGH |
| 62232 | 0.138 | 0.000 | 0.322 | 0.002 | HIGH |
| 62233 | 0.758 | 0.001 | 0.287 | 0.002 | HIGH |
| 62234 | -10.232 | 0.019 | 1.317 | 0.008 | HIGH |
| 62235 | -3.412 | 0.006 | 0.181 | 0.001 | HIGH |
| 62236 | -5.139 | 0.010 | 0.111 | 0.001 | HIGH |
| 62237 | -3.982 | 0.008 | 0.036 | 0.000 | HIGH |
| 62238 | -2.668 | 0.005 | 0.056 | 0.000 | HIGH |
| 62239 | -1.482 | 0.003 | 0.105 | 0.001 | HIGH |
| 62240 | -0.888 | 0.002 | 0.120 | 0.001 | HIGH |
| 62241 | -0.672 | 0.001 | 0.602 | 0.004 | HIGH |
| 62242 | -0.461 | 0.001 | 0.536 | 0.003 | HIGH |
| 62243 | 0.044 | 0.000 | 0.955 | 0.006 | HIGH |
| 62244 | 0.982 | 0.002 | 0.342 | 0.002 | HIGH |
| 62245 | -0.724 | 0.001 | 1.688 | 0.011 | HIGH |
| 62246 | -3.415 | 0.006 | 0.267 | 0.002 | HIGH |
| 62247 | -1.700 | 0.003 | 0.353 | 0.002 | HIGH |
| 62248 | -2.886 | 0.005 | 0.091 | 0.001 | HIGH |
| 62249 | -2.333 | 0.004 | 0.072 | 0.000 | HIGH |
| 62250 | -1.921 | 0.004 | 0.086 | 0.001 | HIGH |
| 62251 | -0.884 | 0.002 | 0.077 | 0.000 | HIGH |
| 62252 | -0.694 | 0.001 | 0.107 | 0.001 | HIGH |
| 62253 | -0.553 | 0.001 | 0.438 | 0.003 | HIGH |
| 62254 | 0.105 | 0.000 | 0.373 | 0.002 | HIGH |
| 62255 | 0.118 | 0.000 | 0.084 | 0.001 | HIGH |
| 62256 | 0.320 | 0.001 | 0.158 | 0.001 | HIGH |
| 62257 | -0.083 | 0.000 | 2.964 | 0.019 | HIGH |
| 62258 | -0.041 | 0.000 | 1.588 | 0.010 | HIGH |
| 62259 | -2.491 | 0.005 | 1.102 | 0.007 | HIGH |
| 62260 | -0.908 | 0.002 | 0.171 | 0.001 | HIGH |
| 62261 | -1.276 | 0.002 | 0.116 | 0.001 | HIGH |
| 62262 | -1.019 | 0.002 | 0.130 | 0.001 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN FUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62263 | -0.834 | 0.002 | 0.040 | 0.000 | HIGH |
| 62264 | -0.529 | 0.001 | 0.041 | 0.000 | HIGH |
| 62265 | -0.651 | 0.001 | 0.053 | 0.000 | HIGH |
| 62266 | -0.262 | 0.000 | 0.129 | 0.001 | HIGH |
| 62267 | -0.033 | 0.000 | 0.161 | 0.001 | HIGH |
| 62268 | 0.198 | 0.000 | 0.073 | 0.000 | HIGH |
| 62269 | 0.163 | 0.000 | 0.069 | 0.000 | HIGH |
| 62270 | 0.863 | 0.002 | 0.331 | 0.002 | HIGH |
| 62271 | 0.092 | 0.000 | 3.696 | 0.024 | HIGH |
| 62272 | 2.514 | 0.005 | 0.842 | 0.005 | HIGH |
| 62273 | 1.450 | 0.003 | 0.191 | 0.001 | HIGH |
| 62274 | 3.501 | 0.007 | 0.511 | 0.003 | HIGH |
| 62275 | 4.974 | 0.009 | 0.393 | 0.003 | HIGH |
| 62278 | 1.861 | 0.004 | 1.403 | 0.009 | HIGH |
| 62279 | 3.783 | 0.007 | 2.608 | 0.017 | HIGH |
| 62280 | 2.056 | 0.004 | 0.329 | 0.002 | HIGH |
| 62281 | 3.764 | 0.007 | 0.276 | 0.002 | HIGH |
| 62282 | -0.086 | 0.000 | 0.249 | 0.002 | HIGH |
| 62283 | 0.449 | 0.001 | 0.155 | 0.001 | HIGH |
| 62286 | 2.882 | 0.005 | 1.011 | 0.006 | HIGH |
| 62287 | 1.955 | 0.004 | 0.674 | 0.004 | HIGH |
| 62288 | 3.136 | 0.006 | 0.180 | 0.001 | HIGH |
| 62289 | 1.981 | 0.004 | 0.170 | 0.001 | HIGH |
| 62290 | -0.760 | 0.001 | 0.117 | 0.001 | HIGH |
| 62293 | 3.055 | 0.006 | 0.254 | 0.002 | HIGH |
| 62294 | 3.420 | 0.006 | 0.239 | 0.002 | HIGH |
| 62295 | 2.870 | 0.005 | 0.061 | 0.000 | HIGH |
| 62296 | 1.569 | 0.003 | 0.065 | 0.000 | HIGH |
| 62297 | -0.411 | 0.001 | 0.053 | 0.000 | HIGH |
| 62300 | 3.414 | 0.006 | 0.113 | 0.001 | HIGH |
| 62301 | 3.158 | 0.006 | 0.087 | 0.001 | HIGH |
| 62302 | 2.754 | 0.005 | 0.041 | 0.000 | HIGH |
| 62303 | 1.575 | 0.003 | 0.017 | 0.000 | HIGH |
| 62304 | 0.840 | 0.002 | 0.066 | 0.000 | HIGH |
| 62308 | 2.614 | 0.005 | 0.088 | 0.001 | HIGH |
| 62309 | 3.581 | 0.007 | 0.087 | 0.001 | HIGH |
| 62310 | 2.681 | 0.005 | 0.056 | 0.000 | HIGH |
| 62311 | 2.086 | 0.004 | 0.103 | 0.001 | HIGH |
| 62312 | 1.785 | 0.003 | 0.102 | 0.001 | HIGH |
| 62316 | 3.099 | 0.006 | 0.163 | 0.001 | HIGH |
| 62317 | 2.840 | 0.005 | 0.168 | 0.001 | HIGH |
| 62318 | 2.659 | 0.005 | 0.118 | 0.001 | HIGH |
| 62319 | 2.454 | 0.005 | 0.192 | 0.001 | HIGH |
| 62320 | 2.216 | 0.004 | 0.183 | 0.001 | HIGH |
| 62323 | 2.693 | 0.005 | 0.289 | 0.002 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62324 | 2.827 | 0.005 | 0.241 | 0.002 | HIGH |
| 62325 | 2.698 | 0.005 | 0.342 | 0.002 | HIGH |
| 62326 | 2.399 | 0.005 | 0.378 | 0.002 | HIGH |
| 62327 | 2.052 | 0.004 | 0.319 | 0.002 | HIGH |
| 62329 | 3.293 | 0.006 | 0.660 | 0.004 | HIGH |
| 62330 | 2.894 | 0.005 | 0.451 | 0.003 | HIGH |
| 62331 | 2.284 | 0.004 | 0.030 | 0.000 | HIGH |
| 62332 | 2.296 | 0.004 | 0.706 | 0.005 | HIGH |
| 62333 | 1.832 | 0.003 | 0.202 | 0.001 | HIGH |
| 62334 | 2.886 | 0.005 | 0.395 | 0.003 | HIGH |
| 62335 | 2.675 | 0.005 | 0.259 | 0.002 | HIGH |
| 62336 | 1.131 | 0.002 | 0.011 | 0.000 | HIGH |
| 62337 | 2.394 | 0.005 | 0.359 | 0.002 | HIGH |
| 62338 | 1.845 | 0.003 | 0.173 | 0.001 | HIGH |
| 62339 | 1.641 | 0.003 | 0.140 | 0.001 | HIGH |
| 62340 | 1.613 | 0.003 | 0.150 | 0.001 | HIGH |
| 62341 | 0.968 | 0.002 | 0.120 | 0.001 | HIGH |
| 62342 | 1.125 | 0.002 | 0.094 | 0.001 | HIGH |
| 62343 | 0.477 | 0.001 | 0.032 | 0.000 | HIGH |
| 62346 | 0.943 | 0.002 | 0.068 | 0.000 | HIGH |
| 62347 | -0.132 | 0.000 | 0.064 | 0.000 | HIGH |
| 62348 | -0.510 | 0.001 | 0.203 | 0.001 | HIGH |
| 62349 | -0.683 | 0.001 | 0.071 | 0.000 | HIGH |
| 62350 | -0.952 | 0.002 | 0.052 | 0.000 | HIGH |
| 62351 | -0.834 | 0.002 | 0.030 | 0.000 | HIGH |
| 62353 | 0.645 | 0.001 | 0.234 | 0.001 | HIGH |
| 62354 | -0.408 | 0.001 | 0.177 | 0.001 | HIGH |
| 62355 | -0.713 | 0.001 | 0.455 | 0.003 | HIGH |
| 62356 | -1.104 | 0.002 | 0.351 | 0.002 | HIGH |
| 62357 | -1.211 | 0.002 | 0.118 | 0.001 | HIGH |
| 62358 | -1.449 | 0.003 | 0.069 | 0.000 | HIGH |
| 62361 | -0.726 | 0.001 | 0.135 | 0.001 | HIGH |
| 62362 | -0.937 | 0.002 | 0.516 | 0.003 | HIGH |
| 62363 | -0.925 | 0.002 | 0.140 | 0.001 | HIGH |
| 62364 | -1.537 | 0.003 | 0.242 | 0.002 | HIGH |
| 62365 | -1.752 | 0.003 | 0.216 | 0.001 | HIGH |
| 62368 | -0.733 | 0.001 | 0.102 | 0.001 | HIGH |
| 62369 | -0.938 | 0.002 | 0.112 | 0.001 | HIGH |
| 62370 | -1.145 | 0.002 | 0.187 | 0.001 | HIGH |
| 62371 | -1.274 | 0.002 | 0.205 | 0.001 | HIGH |
| 62372 | -1.627 | 0.003 | 0.325 | 0.002 | HIGH |
| 62375 | 0.148 | 0.000 | 0.029 | 0.000 | HIGH |
| 62376 | -0.554 | 0.001 | 0.042 | 0.000 | HIGH |
| 62377 | -1.266 | 0.002 | 0.075 | 0.000 | HIGH |
| 62378 | -1.445 | 0.003 | 0.093 | 0.001 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 62379 | -1.270 | 0.002 | 0.703 | 0.004 | HIGH |
| 62383 | 2.021 | 0.004 | 0.052 | 0.000 | HIGH |
| 62384 | 0.034 | 0.000 | 0.014 | 0.000 | HIGH |
| 62385 | -1.086 | 0.002 | 0.042 | 0.000 | HIGH |
| 62386 | -1.738 | 0.003 | 0.060 | 0.000 | HIGH |
| 62387 | -2.331 | 0.004 | 0.264 | 0.002 | HIGH |
| 62390 | 2.573 | 0.005 | 0.114 | 0.001 | HIGH |
| 62391 | 0.293 | 0.001 | 0.063 | 0.000 | HIGH |
| 62392 | -0.996 | 0.002 | 0.060 | 0.000 | HIGH |
| 62393 | -1.386 | 0.003 | 0.063 | 0.000 | HIGH |
| 62394 | -3.137 | 0.006 | 0.169 | 0.001 | HIGH |
| 62396 | 1.870 | 0.004 | 0.322 | 0.002 | HIGH |
| 62397 | -0.772 | 0.001 | 0.165 | 0.001 | HIGH |
| 62398 | -1.888 | 0.004 | 0.172 | 0.001 | HIGH |
| 62399 | -2.411 | 0.005 | 0.133 | 0.001 | HIGH |
| 62400 | -2.624 | 0.005 | 0.067 | 0.000 | HIGH |
| 62401 | -2.217 | 0.004 | 0.745 | 0.005 | HIGH |
| 62402 | -6.258 | 0.012 | 0.447 | 0.003 | HIGH |
| 62403 | -4.483 | 0.008 | 0.524 | 0.003 | HIGH |
| 62404 | -3.267 | 0.006 | 0.471 | 0.003 | HIGH |
| 62405 | -2.800 | 0.005 | 0.141 | 0.001 | HIGH |
| 62406 | -11.309 | 0.021 | 1.748 | 0.011 | HIGH |
| 62407 | -5.841 | 0.011 | 0.825 | 0.005 | HIGH |
| 62408 | -4.764 | 0.009 | 1.289 | 0.008 | HIGH |
| 62409 | -1.822 | 0.003 | 0.354 | 0.002 | HIGH |
| 62410 | -8.161 | 0.015 | 2.764 | 0.018 | HIGH |
| 62411 | -3.951 | 0.007 | 2.283 | 0.015 | HIGH |
| 62412 | -6.108 | 0.012 | 1.538 | 0.010 | HIGH |
| 62413 | -2.953 | 0.006 | 5.187 | 0.033 | HIGH |
| 62414 | -1.767 | 0.003 | 1.798 | 0.011 | HIGH |
| 62415 | -2.076 | 0.004 | 1.656 | 0.011 | HIGH |
| 63301 | 3.186 | 0.006 | 0.035 | 0.000 | HIGH |
| 63302 | -3.146 | 0.006 | 0.038 | 0.000 | HIGH |
| 63303 | -2.397 | 0.005 | 0.035 | 0.000 | HIGH |
| 63304 | 3.993 | 0.008 | 0.013 | 0.000 | HIGH |
| 63305 | -0.612 | 0.001 | 0.033 | 0.000 | HIGH |
| 63306 | 1.037 | 0.002 | 0.042 | 0.000 | HIGH |
| 63307 | 0.435 | 0.001 | 0.047 | 0.000 | HIGH |
| 63308 | -0.019 | 0.000 | 0.050 | 0.000 | HIGH |
| 63313 | 3.048 | 0.006 | 0.020 | 0.000 | HIGH |
| 63314 | 3.393 | 0.006 | 0.020 | 0.000 | HIGH |
| 63319 | 0.045 | 0.000 | 0.048 | 0.000 | HIGH |
| 63320 | 0.516 | 0.001 | 0.036 | 0.000 | HIGH |
| 63321 | 3.835 | 0.007 | 0.032 | 0.000 | HIGH |
| 63322 | 3.430 | 0.006 | 0.030 | 0.000 | HIGH |

552.5.5

S.S.260

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63323 | 2.034 | 0.004 | 0.049 | 0.000 | HIGH |
| 63324 | -0.196 | 0.000 | 0.093 | 0.001 | HIGH |
| 63327 | 1.915 | 0.004 | 0.094 | 0.001 | HIGH |
| 63328 | -0.183 | 0.000 | 0.061 | 0.000 | HIGH |
| 63329 | 0.168 | 0.000 | 0.057 | 0.000 | HIGH |
| 63330 | 0.739 | 0.001 | 0.064 | 0.000 | HIGH |
| 63331 | 3.113 | 0.006 | 0.060 | 0.000 | HIGH |
| 63332 | 2.737 | 0.005 | 0.034 | 0.000 | HIGH |
| 63333 | 2.615 | 0.005 | 0.077 | 0.000 | HIGH |
| 63334 | 1.428 | 0.003 | 0.216 | 0.001 | HIGH |
| 63338 | 1.100 | 0.002 | 0.231 | 0.001 | HIGH |
| 63339 | 0.267 | 0.001 | 0.100 | 0.001 | HIGH |
| 63340 | 0.569 | 0.001 | 0.058 | 0.000 | HIGH |
| 63341 | 0.884 | 0.002 | 0.081 | 0.001 | HIGH |
| 63342 | 2.427 | 0.005 | 0.062 | 0.000 | HIGH |
| 63343 | 1.808 | 0.003 | 0.037 | 0.000 | HIGH |
| 63344 | 1.554 | 0.003 | 0.103 | 0.001 | HIGH |
| 63345 | 1.545 | 0.003 | 0.246 | 0.002 | HIGH |
| 63350 | 0.566 | 0.001 | 0.288 | 0.002 | HIGH |
| 63351 | 0.531 | 0.001 | 0.130 | 0.001 | HIGH |
| 63352 | 0.749 | 0.001 | 0.042 | 0.000 | HIGH |
| 63353 | 1.210 | 0.002 | 0.076 | 0.000 | HIGH |
| 63354 | 1.815 | 0.003 | 0.044 | 0.000 | HIGH |
| 63355 | 1.154 | 0.002 | 0.041 | 0.000 | HIGH |
| 63356 | 0.809 | 0.002 | 0.043 | 0.000 | HIGH |
| 63357 | 0.157 | 0.000 | 0.217 | 0.001 | HIGH |
| 63363 | 0.296 | 0.001 | 0.210 | 0.001 | HIGH |
| 63364 | 0.458 | 0.001 | 0.092 | 0.001 | HIGH |
| 63365 | 0.999 | 0.002 | 0.022 | 0.000 | HIGH |
| 63366 | 2.243 | 0.004 | 0.031 | 0.000 | HIGH |
| 63367 | 1.194 | 0.002 | 0.020 | 0.000 | HIGH |
| 63368 | 0.643 | 0.001 | 0.021 | 0.000 | HIGH |
| 63369 | 0.388 | 0.001 | 0.020 | 0.000 | HIGH |
| 63370 | -0.078 | 0.000 | 0.053 | 0.000 | HIGH |
| 63371 | -1.216 | 0.002 | 0.209 | 0.001 | HIGH |
| 63376 | -0.307 | 0.001 | 0.131 | 0.001 | HIGH |
| 63377 | -0.209 | 0.000 | 0.118 | 0.001 | HIGH |
| 63378 | 0.328 | 0.001 | 0.038 | 0.000 | HIGH |
| 63379 | 1.151 | 0.002 | 0.009 | 0.000 | HIGH |
| 63380 | 3.107 | 0.006 | 0.035 | 0.000 | HIGH |
| 63381 | 0.338 | 0.001 | 0.008 | 0.000 | HIGH |
| 63382 | 0.077 | 0.000 | 0.003 | 0.000 | HIGH |
| 63383 | -0.068 | 0.000 | 0.005 | 0.000 | HIGH |
| 63384 | -0.298 | 0.001 | 0.011 | 0.000 | HIGH |
| 63385 | -0.782 | 0.001 | 0.013 | 0.000 | HIGH |

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63386 | -1.234 | 0.002 | 0.144 | 0.001 | HIGH |
| 63390 | -0.913 | 0.002 | 0.163 | 0.001 | HIGH |
| 63391 | -0.825 | 0.002 | 0.067 | 0.000 | HIGH |
| 63392 | -0.579 | 0.001 | 0.029 | 0.000 | HIGH |
| 63393 | -0.193 | 0.000 | 0.015 | 0.000 | HIGH |
| 63394 | 0.084 | 0.000 | 0.037 | 0.000 | HIGH |
| 63396 | 0.945 | 0.002 | 0.024 | 0.000 | HIGH |
| 63397 | 0.938 | 0.002 | 0.020 | 0.000 | HIGH |
| 63398 | 1.041 | 0.002 | 0.021 | 0.000 | HIGH |
| 63399 | 1.172 | 0.002 | 0.014 | 0.000 | HIGH |
| 63400 | 1.209 | 0.002 | 0.027 | 0.000 | HIGH |
| 63401 | 0.963 | 0.002 | 0.029 | 0.000 | HIGH |
| 63402 | 0.599 | 0.001 | 0.027 | 0.000 | HIGH |
| 63403 | -0.803 | 0.002 | 0.099 | 0.001 | HIGH |
| 63406 | 0.728 | 0.001 | 0.047 | 0.000 | HIGH |
| 63407 | 1.013 | 0.002 | 0.034 | 0.000 | HIGH |
| 63408 | 1.279 | 0.002 | 0.031 | 0.000 | HIGH |
| 63409 | 1.634 | 0.003 | 0.043 | 0.000 | HIGH |
| 63410 | 1.897 | 0.004 | 0.052 | 0.000 | HIGH |
| 63411 | 2.028 | 0.004 | 0.052 | 0.000 | HIGH |
| 63412 | 2.997 | 0.006 | 0.066 | 0.000 | HIGH |
| 63413 | 1.859 | 0.004 | 0.191 | 0.001 | HIGH |
| 63415 | 0.863 | 0.002 | 0.073 | 0.000 | HIGH |
| 63416 | 1.236 | 0.002 | 0.070 | 0.000 | HIGH |
| 63417 | 1.713 | 0.003 | 0.053 | 0.000 | HIGH |
| 63418 | 2.374 | 0.004 | 0.060 | 0.000 | HIGH |
| 63419 | 2.393 | 0.005 | 0.065 | 0.000 | HIGH |
| 63420 | 2.145 | 0.004 | 0.064 | 0.000 | HIGH |
| 63421 | 3.740 | 0.007 | 0.076 | 0.000 | HIGH |
| 63424 | 0.976 | 0.002 | 0.117 | 0.001 | HIGH |
| 63425 | 1.579 | 0.003 | 0.094 | 0.001 | HIGH |
| 63426 | 2.723 | 0.005 | 0.112 | 0.001 | HIGH |
| 63432 | 0.769 | 0.001 | 0.221 | 0.001 | HIGH |
| 63433 | 1.520 | 0.003 | 0.203 | 0.001 | HIGH |
| 63440 | -0.183 | 0.000 | 0.447 | 0.003 | HIGH |
| 63450 | -1.268 | 0.002 | 0.488 | 0.003 | HIGH |
| 63455 | 0.433 | 0.001 | 0.199 | 0.001 | HIGH |
| 63456 | 2.303 | 0.004 | 0.075 | 0.000 | HIGH |
| 63457 | 1.455 | 0.003 | 0.100 | 0.001 | HIGH |
| 63463 | 0.823 | 0.002 | 0.101 | 0.001 | HIGH |
| 63464 | 1.389 | 0.003 | 0.097 | 0.001 | HIGH |
| 63465 | 1.024 | 0.002 | 0.089 | 0.001 | HIGH |
| 63467 | 0.418 | 0.001 | 0.347 | 0.002 | HIGH |
| 63470 | 0.750 | 0.001 | 0.136 | 0.001 | HIGH |
| 63471 | 0.801 | 0.002 | 0.126 | 0.001 | HIGH |

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ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63472 | 0.515 | 0.001 | 0.068 | 0.000 | HIGH |
| 63473 | 0.038 | 0.000 | 0.085 | 0.001 | HIGH |
| 63474 | 0.796 | 0.002 | 0.509 | 0.003 | HIGH |
| 63475 | 0.609 | 0.001 | 0.090 | 0.001 | HIGH |
| 63476 | 0.528 | 0.001 | 0 102 | 0.001 | HIGH |
| 63477 | 0.385 | 0.001 | 0.102 | 0.001 | HIGH |
| 63478 | 0.185 | 0.000 | 0.045 | 0.000 | HIGH |
| 63479 | -0.034 | 0.000 | 0.132 | 0.001 | HIGH |
| 63480 | 1.107 | 0.002 | 0.379 | 0.002 | HIGH |
| 63481 | 0.988 | 0.002 | 0.142 | 0.001 | HIGH |
| 63482 | 0.473 | 0.001 | 0.117 | 0.001 | HIGH |
| 63483 | -0.047 | 0.000 | 0.073 | 0.000 | HIGH |
| 63484 | -0.341 | 0.001 | 0.144 | 0.001 | HIGH |
| 63485 | 1.173 | 0.002 | 0.190 | 0.001 | HIGH |
| 63486 | 0.991 | 0.002 | 0.158 | 0.001 | HIGH |
| 63487 | 0.191 | 0.000 | 0.128 | 0.001 | HIGH |
| 63488 | -0.737 | 0.001 | 0.142 | 0.001 | HIGH |
| 63489 | 1.488 | 0.003 | 0.172 | 0.001 | HIGH |
| 63490 | 1.485 | 0.003 | 0.169 | 0.001 | HIGH |
| 63491 | -0.137 | 0.000 | 0.142 | 0.001 | HIGH |
| 63492 | 4.207 | 0.008 | 0.155 | 0.001 | HIGH |
| 63499 | 1.106 | 0.002 | 0.049 | 0.000 | HIGH |
| 63500 | 0.273 | 0.001 | 0.018 | 0.000 | HIGH |
| 63501 | -0.336 | 0.001 | 0.023 | 0.000 | HIGH |
| 63502 | -0.688 | 0.001 | 0.019 | 0.000 | HIGH |
| 63503 | -1.111 | 0.002 | 0.006 | 0.000 | HIGH |
| 63504 | -2.252 | 0.004 | 0.006 | 0.000 | HIGH |
| 63505 | -4.366 | 0.008 | 0.240 | 0.002 | HIGH |
| 63509 | 0.104 | 0.000 | 0.033 | 0.000 | HIGH |
| 63510 | -0.312 | 0.001 | 0.041 | 0.000 | HIGH |
| 63511 | -0.603 | 0.001 | 0.042 | 0.000 | HIGH |
| 63512 | -0.809 | 0.002 | 0.030 | 0.000 | HIGH |
| 63513 | -1.336 | 0.003 | 0.039 | 0.000 | HIGH |
| 63514 | -2.143 | 0.004 | 0.080 | 0.001 | HIGH |
| 63515 | -2.188 | 0.004 | 0.102 | 0.001 | HIGH |
| 63518 | -2.398 | 0.005 | 0.066 | 0.000 | HIGH |
| 63519 | -1.134 | 0.002 | 0.059 | 0.000 | HIGH |
| 63520 | -0.698 | 0.001 | 0.060 | 0.000 | HIGH |
| 63521 | -0.653 | 0.001 | 0.050 | 0.000 | HIGH |
| 63522 | -0.801 | 0.002 | 0.074 | 0.000 | HIGH |
| 63523 | -1.322 | 0.002 | 0.085 | 0.001 | HIGH |
| 63524 | -1.529 | 0.003 | 0.086 | 0.001 | HIGH |
| 63530 | -0.517 | 0.001 | 0.092 | 0.001 | HIGH |
| 63531 | -0.601 | 0.001 | 0.166 | 0.001 | HIGH |
| 63532 | -0.706 | 0.001 | 0.188 | 0.001 | HIGH |

5.5.262

ISOGRID BAR FORCES AND MARGINS OF SAFETY
FROM AFE NASTRAN RUN TITLED: STER LOADS - SRM ATTACHED

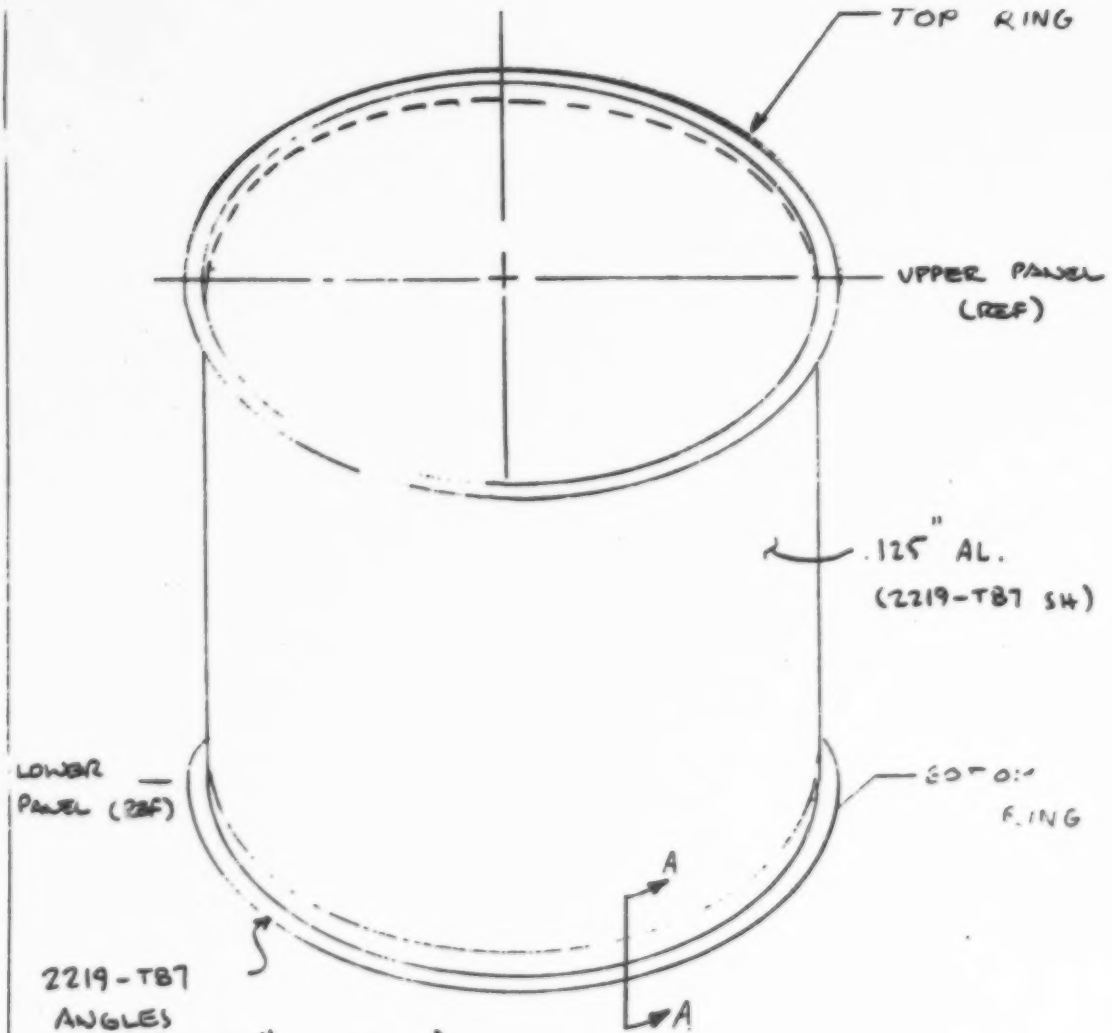
| BAR ID | AXIAL FORCE | AX. STRESS RATIO | BENDING MOMENT | BEND. STRESS RATIO | MARGIN OF SAFETY |
|---|---|---|---|---|---|
| 63539 | 0.409 | 0.001 | 0.253 | 0.002 | HIGH |
| 63540 | 0.318 | 0.001 | 0.297 | 0.002 | HIGH |
| 63550 | 1.567 | 0.003 | 0.802 | 0.005 | HIGH |
| 63553 | -2.202 | 0.004 | 0.082 | 0.001 | HIGH |
| 63554 | -0.522 | 0.001 | 0.188 | 0.001 | HIGH |
| 63559 | 0.527 | 0.001 | 1.234 | 0.008 | HIGH |
| 63561 | -4.174 | 0.008 | 0.059 | 0.000 | HIGH |
| 63562 | -3.152 | 0.006 | 0.093 | 0.001 | HIGH |
| 63563 | -2.945 | 0.006 | 0.101 | 0.001 | HIGH |
| 63568 | -3.216 | 0.006 | 0.039 | 0.000 | HIGH |
| 63569 | -3.527 | 0.007 | 0.035 | 0.000 | HIGH |
| 63570 | -3.391 | 0.006 | 0.098 | 0.001 | HIGH |
| 63571 | -3.364 | 0.006 | 0.102 | 0.001 | HIGH |
| 63574 | 0.897 | 0.002 | 0.343 | 0.00[illegible] | HIGH |
| 63575 | -2.648 | 0.005 | 0.047 | 0.000 | HIGH |
| 63576 | -2.827 | 0.005 | 0.037 | 0.000 | HIGH |
| 63577 | -2.558 | 0.005 | 0.064 | 0.000 | HIGH |
| 63578 | -1.891 | 0.004 | 0.066 | 0.000 | HIGH |
| 63579 | -0.742 | 0.001 | 0.054 | 0.000 | HIGH |
| 63580 | 0.236 | 0.000 | 0.267 | 0.002 | HIGH |
| 63581 | -2.369 | 0.004 | 0.048 | 0.000 | HIGH |
| 63582 | -2.231 | 0.004 | 0.041 | 0.000 | HIGH |
| 63583 | -1.869 | 0.004 | 0.046 | 0.000 | HIGH |
| 63584 | -1.386 | 0.003 | 0.051 | 0.000 | HIGH |
| 63585 | -0.769 | 0.001 | 0.194 | 0.001 | HIGH |
| 63586 | -2.020 | 0.004 | 0.046 | 0.000 | HIGH |
| 63587 | -1.749 | 0.003 | 0.029 | 0.000 | HIGH |
| 63588 | -1.475 | 0.003 | 0.032 | 0.000 | HIGH |
| 63589 | -1.107 | 0.002 | 0.127 | 0.001 | HIGH |
| 63590 | -1.658 | 0.003 | 0.050 | 0.000 | HIGH |
| 63591 | -1.398 | 0.003 | 0.013 | 0.000 | HIGH |
| 63592 | -1.123 | 0.002 | 0.055 | 0.000 | HIGH |
| 63593 | -1.318 | 0.002 | 0.050 | 0.000 | HIGH |
| 63594 | -1.102 | 0.002 | 0.036 | 0.000 | HIGH |
| 63595 | -0.937 | 0.002 | 0.032 | 0.000 | HIGH |

5.5.263

| Prepared by: T.O. Murray | Date 6/30/89 | LOCKHEED MISSILES & SPACE COMPANY, INC. | Page 5.6.1 |
|---|---|---|---|
| Checked by: | Date | Title AFE CARRIER VEHICLE STRESS ANALYSIS | Model AFE-CV |
| Approved by: | Date | | Report No. |

5:6 CENTER CYLINDER RING ANALYSIS

- STRUCTURAL DESCRIPTION

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FORM LMSC 362 B 3

## 5.6 CYLINDER RING ANALYSIS (CONT'D)

CRITICAL SECTION MOMENTS (i.-16)

TOP RING

| LOAD CASE | BAY | PLANE 1 | PLANE 2 | REF. # |
|---|---|---|---|---|
| LIFTOFF | 4/5 | 1120 | 0 | 1 |
| LANDING ABORT | 5/6 | 1020 | -40 | 2 |
| REGULAR LANDING | 1/6 | 1280 | 80 | 3 |

BOTTOM RING

| LOAD CASE | BAY | PLANE 1 | PLANE 2 | REF # |
|---|---|---|---|---|
| LIFTOFF | 1 | -750 | -150 | 4 |
| LANDING ABORT | 5 | 500 | -50 | 5 |
| REGULAR LANDING | 5 | -1080 | -1550 | 6 |

MARGINS OF SAFETY SUMMARY TABLE

| COMBINED BENDING MOMENTS | M.S |
|---|---|
| • TOP RING | |
| LIFTOFF | 1.1 |
| LANDING ABORT | 0.88 |
| REGULAR LANDING | 0.48 |
| • BOTTOM RING | |
| LIFTOFF | 1.4 |
| LANDING ABORT | HIGH |
| REGULAR LANDING | 0.15 |

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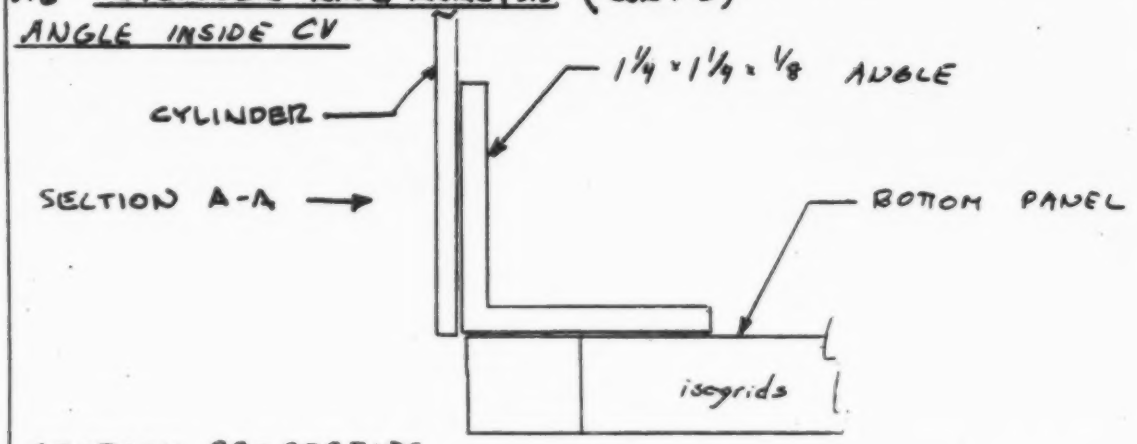
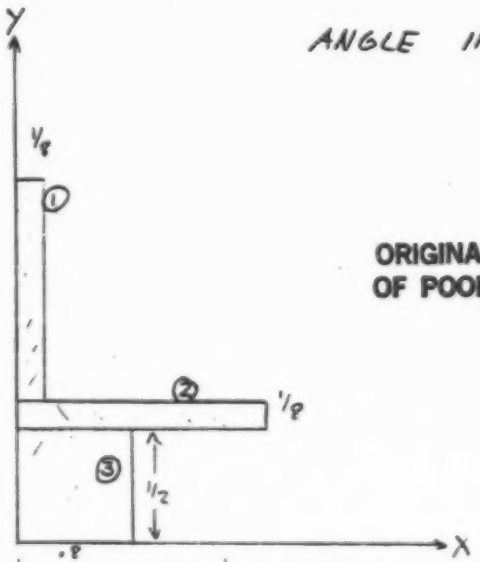
## 5.6 CYLINDER RING ANALYSIS (CONT'D)

ANGLE INSIDE CV




SECTION PROPERTIES




ANGLE INSIDE CV

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| | A | x | y | $A_x$ | $A_y$ | $A_{x^2}$ | $A_{y^2}$ | $I_{ox}$ | $I_{oy}$ | $A_{xy}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .1406 | .0625 | 1.1875 | .0088 | .1670 | .0006 | .1983 | .0149 | .0002 | .0104 |
| 2 | .1563 | .6250 | .5625 | .0977 | .0879 | .0611 | .0494 | .0002 | .0203 | .0549 |
| 3 | 0.40 | 0.40 | .25 | .1600 | .1000 | .0640 | .025 | .0083 | .0213 | .0400 |
| | .6969 | | | .2665 | .3549 | .1257 | .2727 | .0233 | .0418 | .1053 |

$\bar{x} = \Sigma A_x / \Sigma A = .2665 / .6969 = 0.3824$

$\bar{y} = \Sigma A_y / \Sigma A = .3549 / .6969 = 0.5093$

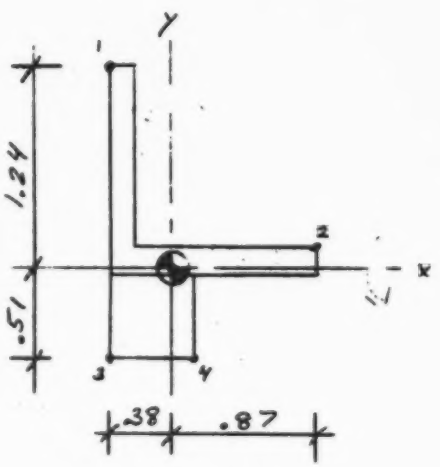
FORM LMSC 382 B-3

SECTION PROPERTIES cont.

$$I_{x\,cg} = \Sigma I_{xo} + \Sigma(Ay^2) - \Sigma A(\bar{y})^2$$
$$= 0.0233 + 0.2727 - 0.6969(0.5093)^2 = 0.1152$$

$$I_{y\,cg} = \Sigma I_{yo} + \Sigma(Ax^2) - \Sigma A(\bar{x})^2$$
$$= 0.0419 + 0.1257 - 0.6969(0.3824)^2 = 0.0656$$

$$I_{xy\,cg} = \Sigma(Axy) - \Sigma A(\bar{x})(\bar{y})$$
$$= 0.1063 - 0.6969(.3824)(.5093)$$
$$= -0.0304$$




SECTION w/ CG LOCATION

$I_{x\,cg} = 0.1152$ in$^4$
$I_{y\,cg} = 0.0656$ in$^4$
$I_{xy} = -0.0304$ in$^4$

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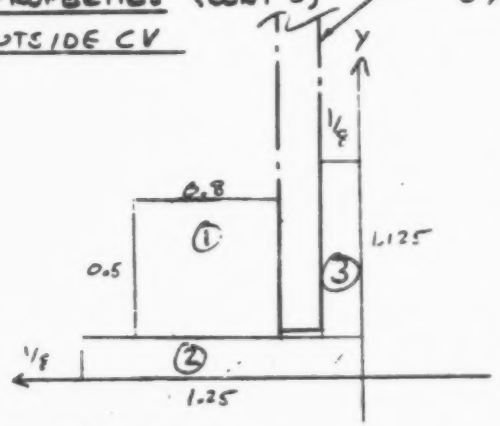
| Prepared by: T.O. Mulloy | Date 6/30/88 | LOCKHEED MISSILES & SPACE COMPANY, INC. | Page 5.6.5 |
|---|---|---|---|
| Checked by: | Date | Title AFE CARRIER VEHICLE STRESS ANALYSIS | Model AFE-CV |
| Approved by: | Date | | Report No |

## SECTION PROPERTIES (CONT'D)

ANGLE OUTSIDE CV




Bottom Cylinder Ring w/ Bottom Panel Isogrid Stiffness

ANGLE OUTSIDE CV

SECTION PROPERTIES

| | A | x | y | Ax | Ax² | Ay | Ay² |
|---|---|---|---|---|---|---|---|
| 1 | 0.40 | 0.65 | 0.375 | .26 | .169 | .15 | .0563 |
| 2 | 0.1562 | .625 | 0.0625 | .0977 | .0611 | .0098 | .0006 |
| 3 | 0.1406 | .0625 | .6875 | .0088 | .0005 | .0967 | .0665 |
| ΣA = 0.6969 | | | | .3665 | .2306 | .2580 | .1234 |

| | Iox | Ioy | Axy |
|---|---|---|---|
| 1 | .0083 | .0213 | .0975 |
| 2 | .0002 | .0203 | .0061 |
| 3 | .0148 | .0002 | .0060 |
| | .0233 | .0418 | .1096 |

$\bar{x} = \Sigma Ax / \Sigma A = .3665 / .6969 = 0.5259$

$\bar{y} = \Sigma Ay / \Sigma A = .2580 / .6969 = 0.3702$

$I_{x\,cg} = \Sigma I_{ox} + \Sigma(Ay^2) - (\Sigma A(\bar{y})^2 = 0.0512$

$I_{y\,cg} = \Sigma I_{oy} + \Sigma(Ax^2) - (\Sigma A(\bar{x})^2 = .0727$

$I_{xy\,cg} = \Sigma(Axy) - \Sigma A(\bar{x})(\bar{y}) = -0.026$

(Top + Bottom Plate)

PBAR, 121, 2219, 0.6969, 7.97E-2, 5.12E-2, 0.01

(NASTRAN)

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5.6 CYLINDER RING ANALYSIS (CONT'D)

REF # 1 ~ TOP RING, LIFTOFF CONDITION

$$f_b = \frac{Mc}{I_y} = \frac{1120 \text{ in-lb } (0.87 \text{ in})}{0.0656 \text{ in}^4} = 14.9 \text{ ksi}$$

$$MS = \frac{63}{2.0(14.9)} - 1 = \underline{\underline{1.11}}$$

REF # 2 ~ TOP RING, LANDING ABORT

$M_y = 1020$ in-lb

$M_x = -40$ in-lb

critical point = 2 tension stress

$x = -0.87$

$y = -0.24$ because of sign convention

$$f_b = \frac{M_x I_{xy} - M_y I_x}{I_x I_y - I_{xy}^2}(x) + \frac{M_y I_{xy} - M_x I_y}{I_x I_y - I_{xy}^2}(y)$$

$$= \frac{(40)(-.0304) - (1020)(.1152)}{(.1152)(.0656) - (.0304)^2}(-.87)$$

$$+ \frac{(1020)(-.0304) - (40)(.0656)}{(.1152)(.0656) - (.0304)^2}(-.24)$$

$= 15.57 + 1.22 = 16.79$ ksi

$$MS = \frac{63}{2.0(16.8)} - 1 = \underline{\underline{0.88}}$$

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| Prepared by: T.O. Murray | Date 7/7/88 | LOCKHEED MISSILES & SPACE COMPANY, INC. | Page 5.67 |
|---|---|---|---|
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5.6 CYLINDER RING ANALYSIS (CONT'D)

REF # 3 ~ TOP RING, REGULAR LANDING

$M_y = 1280$ in-lb
$M_x = 80$ in-lb
critical pt = 2
$X = +0.87$
$Y = +0.24$

$$f_o = \frac{M_x I_{xy} - M_y I_x}{I_x I_y - (I_{xy})^2}(x) + \frac{M_y I_{xy} - M_x I_y}{I_x I_y - (I_{xy})^2}(y)$$

$$= \frac{80(-.0304) - (1280)(.115^2)}{(.115^2)(.0656) - (.0304)^2}(.87)$$

$$+ \frac{1280(-.0304) - (80)(.0656)}{(.115^2)(.0656) - (.0304)^2}(.24)$$

$$= -19.66 \text{ ksi} - 1.60 \text{ ksi} = -21.3 \text{ ksi}$$

$$MS = \frac{63}{2.0(21.3)} - 1 = \underline{\underline{0.48}}$$

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5.6 CYLINDER RING ANALYSIS (CONT'D)

REF #4 ~ BOTTOM RING, LIFTOFF CONDITION

$M_y = -750$ in-lb
$M_x = -150$ in-lb
critical point = 2 $M_y = 5 \times M_x$

$x = -0.87$
$y = -0.24$

$$f_b = \frac{M_x I_{xy} - M_y I_x}{I_x I_y - I_{xy}^2}(x) + \frac{M_y I_{xy} - M_x I_y}{I_x I_y - I_{xy}^2}(y)$$

$$f_b = \frac{(150)(-.0304) - (750)(.1152)}{(.1152)(.0656) - (.0304)^2}(-.87)$$

$$+ \frac{(750)(-.0304) - (150)(.0656)}{(.1152)(.0656) - (.0304)^2}(-.24)$$

$= 11.93 + 1.18 = 13.1$ ksi

$$MS = \frac{63}{2.0(13.1)} - 1 = \underline{1.40}$$

REF #5 ~ BOTTOM RING, LANDING ABORT

MS > 1.40 by comparison w/ REF #4

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5.6 CYLINDER RING ANALYSIS (CONT'D)

REF #6 ~ BOTTOM RING, REGULAR LANDING

$M_y = -410$ and $M_y = -1080$
$M_x = -1800$ $M_x = -1550$
critical pt = 2

$x = -0.872$ in
$y = -0.24$ in

$$f_b = \frac{M_x I_{xy} - M_y I_x}{I_x I_y - I_{xy}^2}(x) + \frac{M_y I_{xy} - M_x I_y}{I_x I_y - I_{xy}^2}(y)$$

$$= \frac{1550(-0.0304) - (1080)(.1152)}{(.1152)(.0656) - (.0304)^2}(-.87)$$

$$+ \frac{1080(-.0304) - (1550)(.0656)}{(.1152)(.0656) - (.0304)^2}(-.24)$$

$$= 22.50 + 4.87 = 27.4 \text{ ksi}$$

$$M.S. = \frac{63}{2.0(27.4)} - 1 = \underline{0.15}$$

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FORM LMSC 302 8-3

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5.6 CYLINDER RING ANALYSIS (CONT'D)
LIFTOFF LOADS
TOP RING

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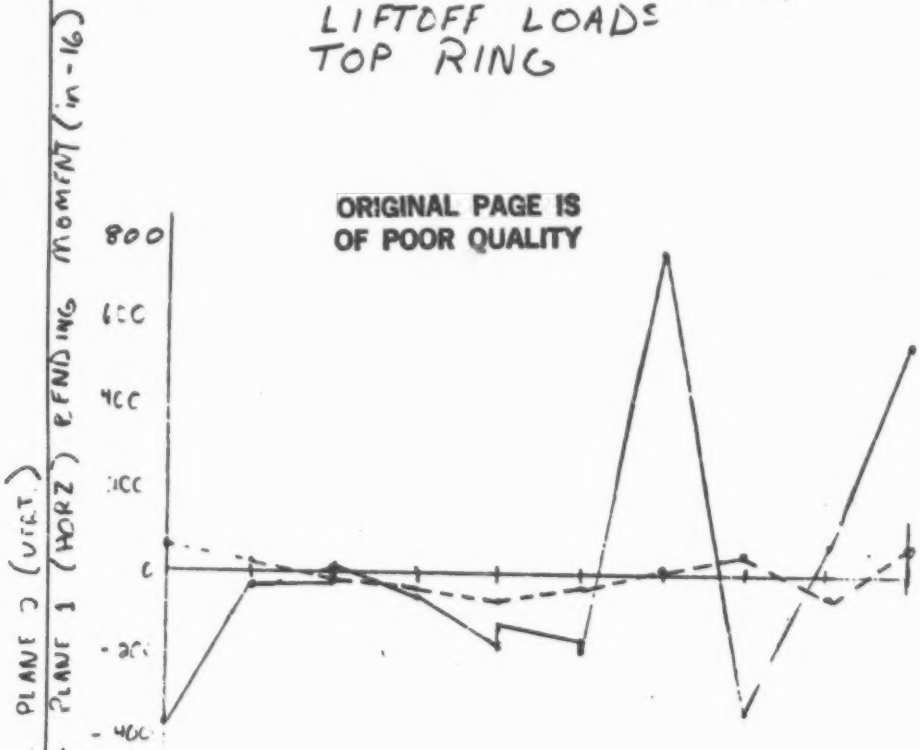
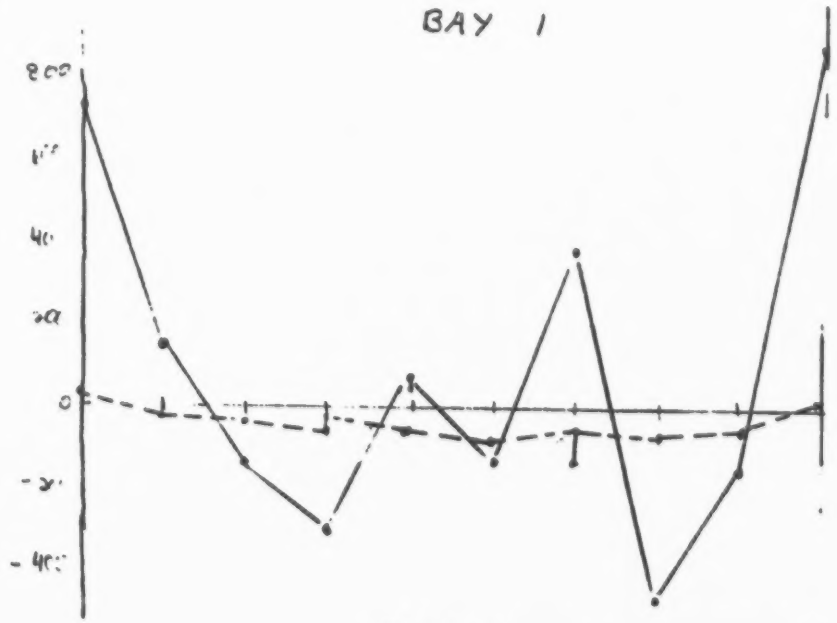



BAY 1




BAY 2

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| Prepared by: D.E. Kiefling | Date 7/6/88 | LOCKHEED MISSILES & SPACE COMPANY, INC. | Page 5.6.11 |
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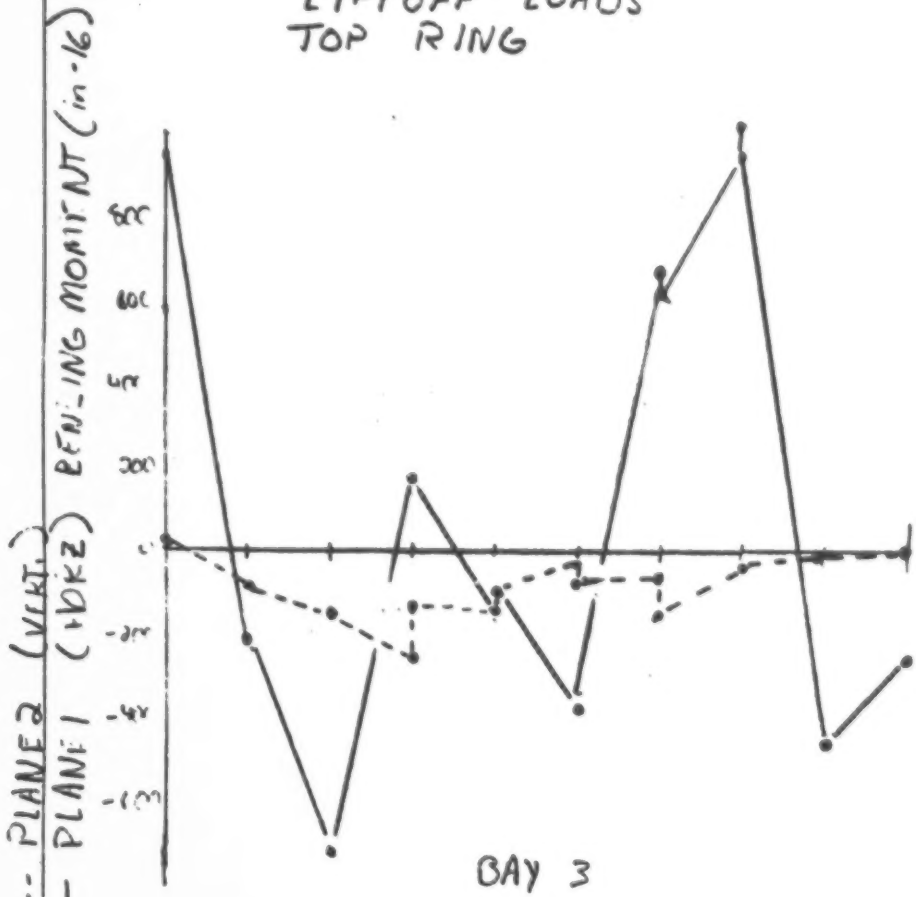
5.6 CYLINDER RING ANALYSIS (CONT'D)
LIFTOFF LOADS
TOP RING

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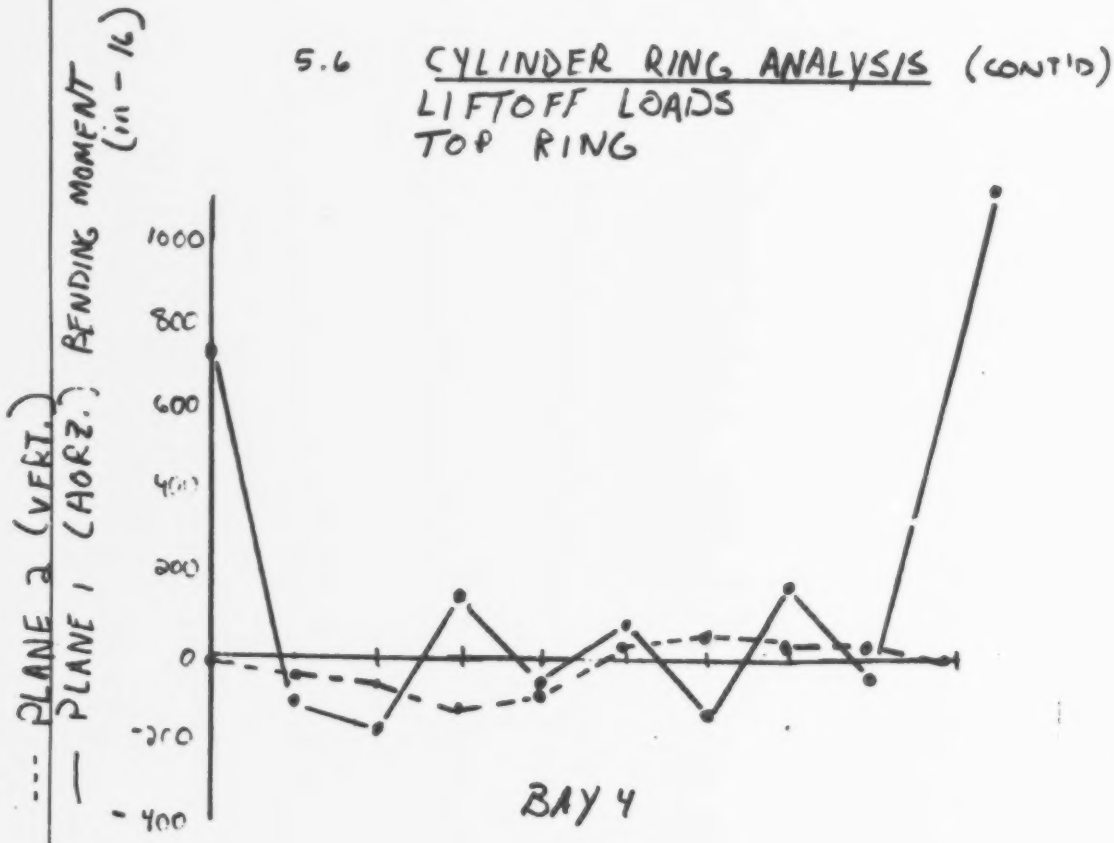
FORM LMSC 362 B-3

5.6 CYLINDER RING ANALYSIS (CONT'D)

LIFTOFF LOADS

TOP RING

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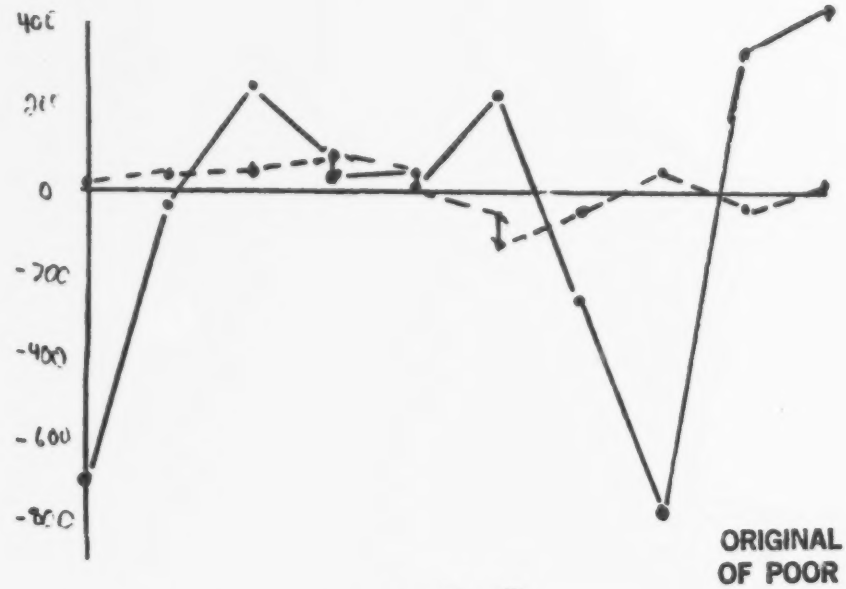


BAY 5

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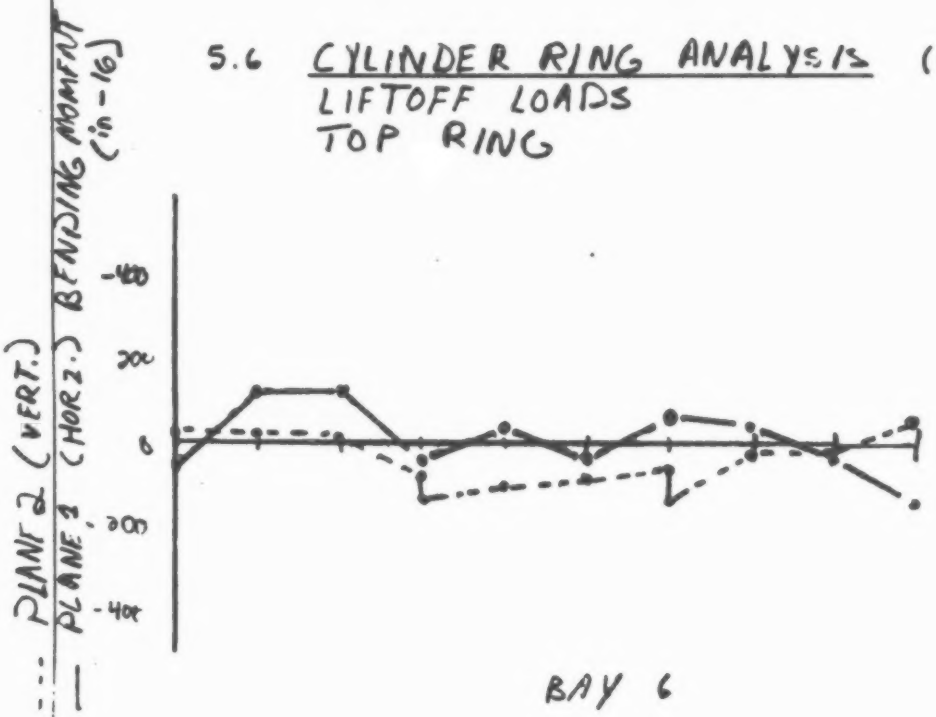
5.6 CYLINDER RING ANALYSIS (CONT'D)

LIFTOFF LOADS

TOP RING



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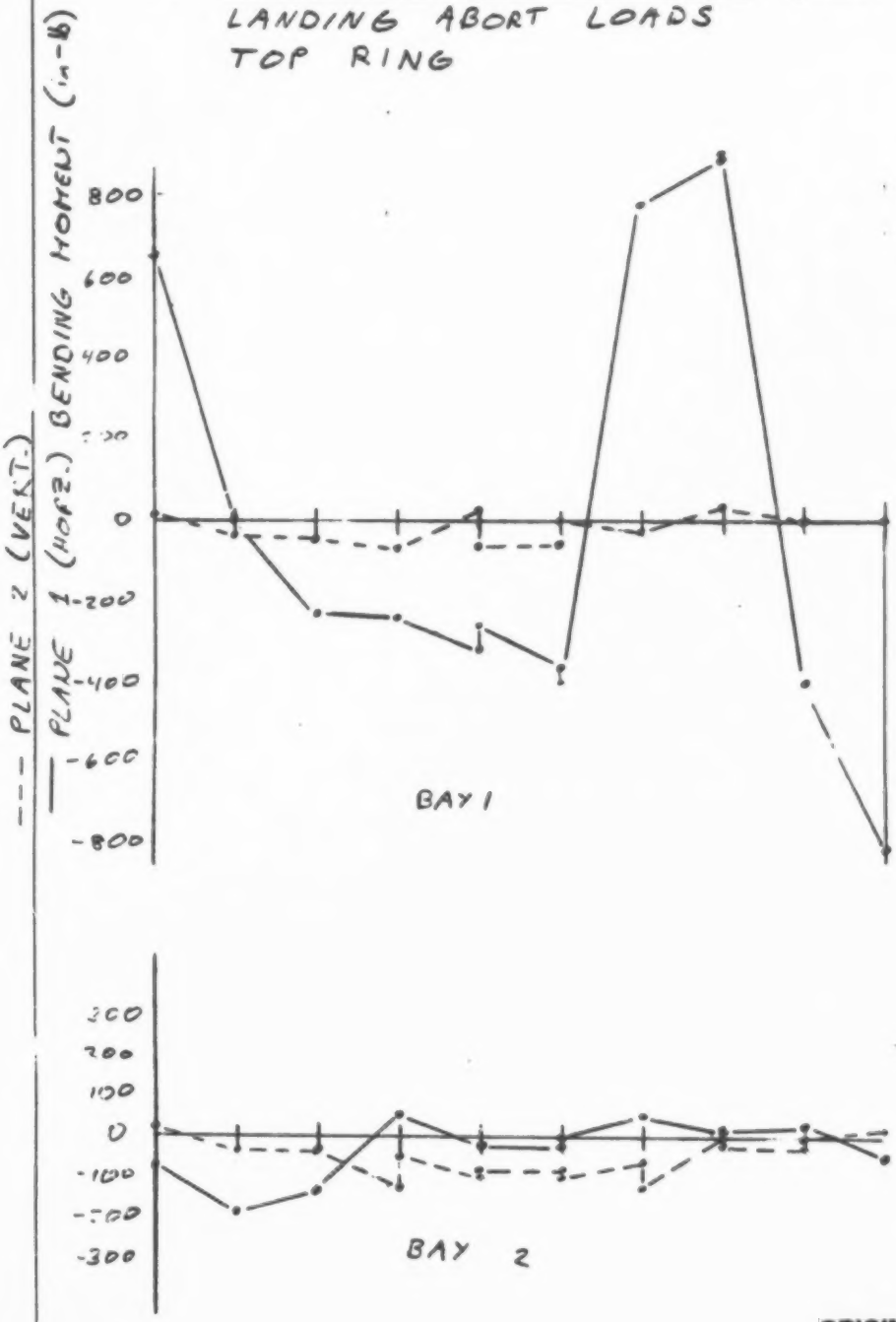
5.6 CYLINDER RING ANALYSIS (CONT'D)

LANDING ABORT LOADS

TOP RING

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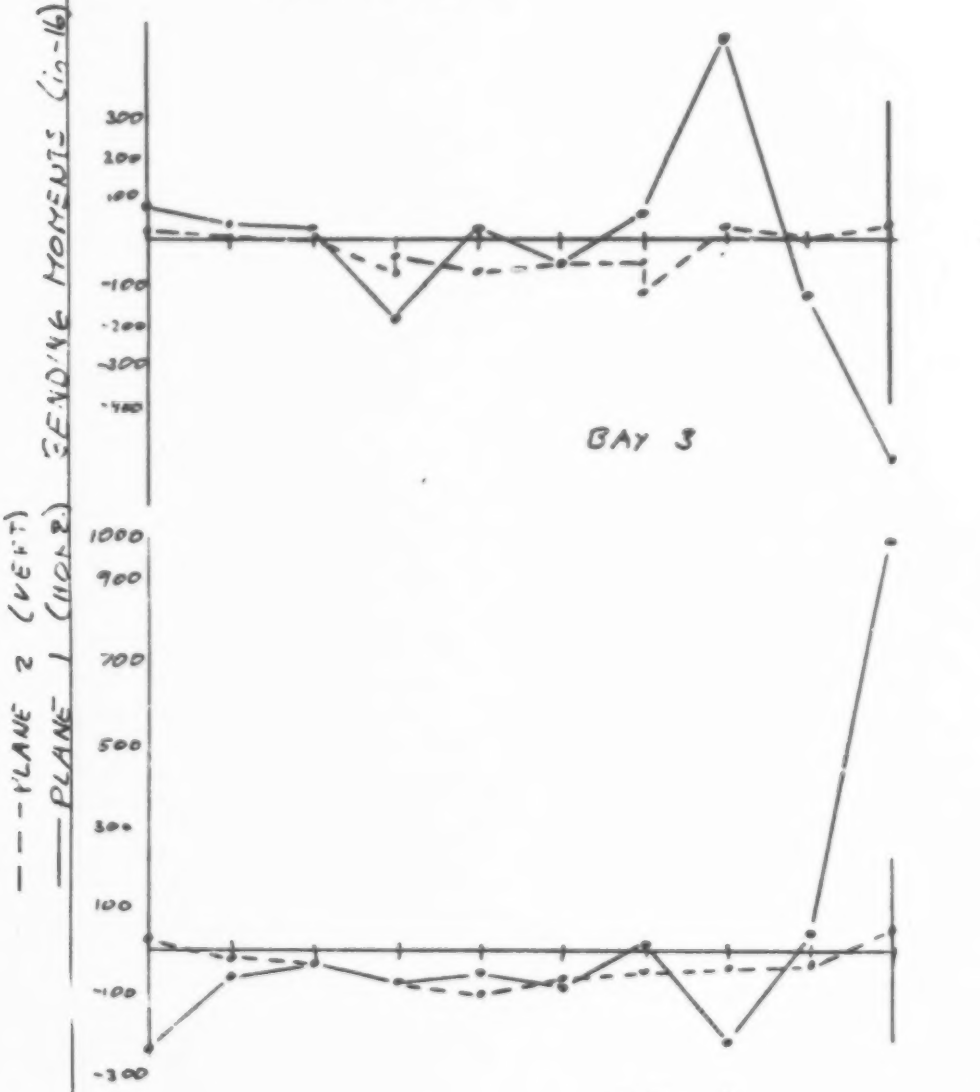
5.6 CYLINDER RING ANALYSIS (CONT'D)

LANDING ABORT LOADS

TOP RING

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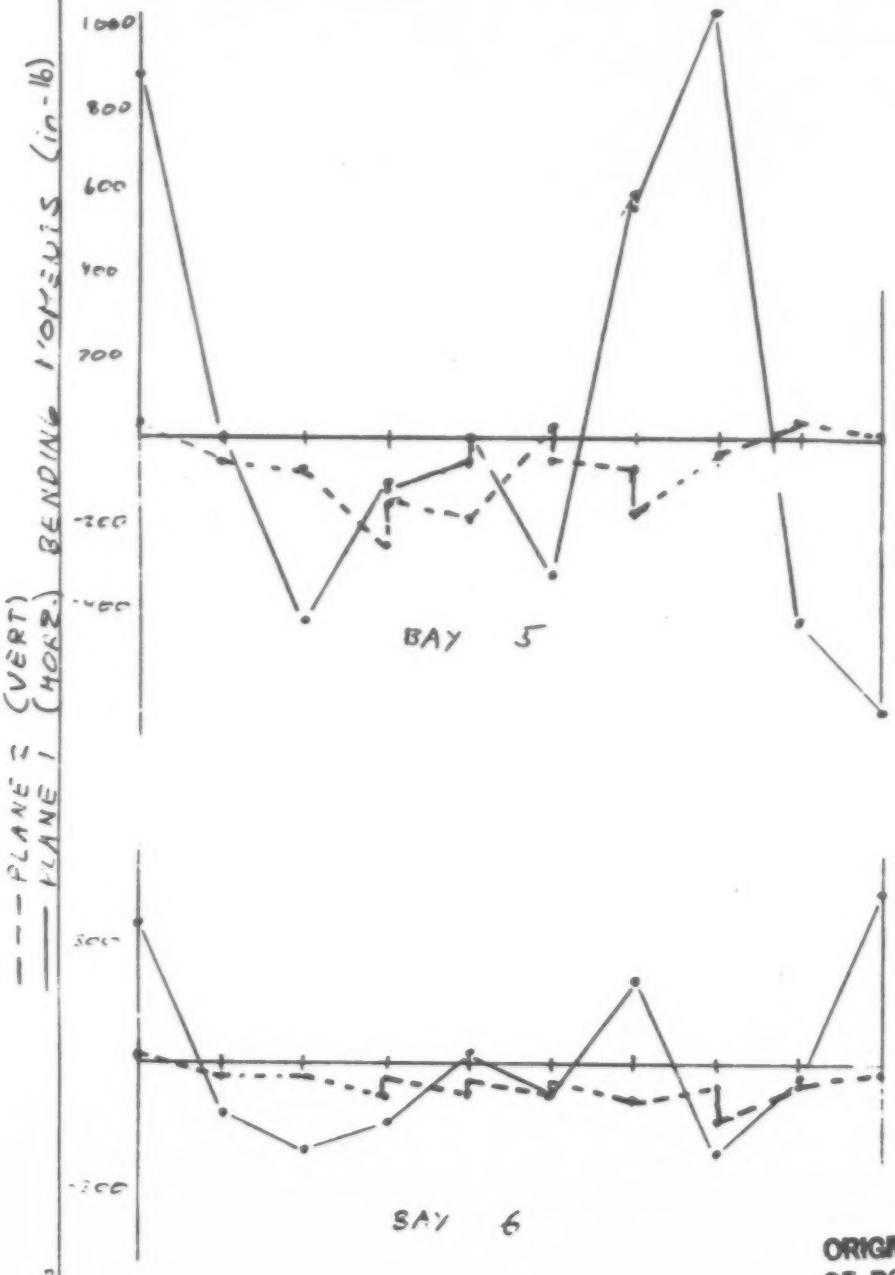
5.6 CYLINDER RING ANALYSIS (CONT'D)

LANDING ABORT LOADS

TOP RING

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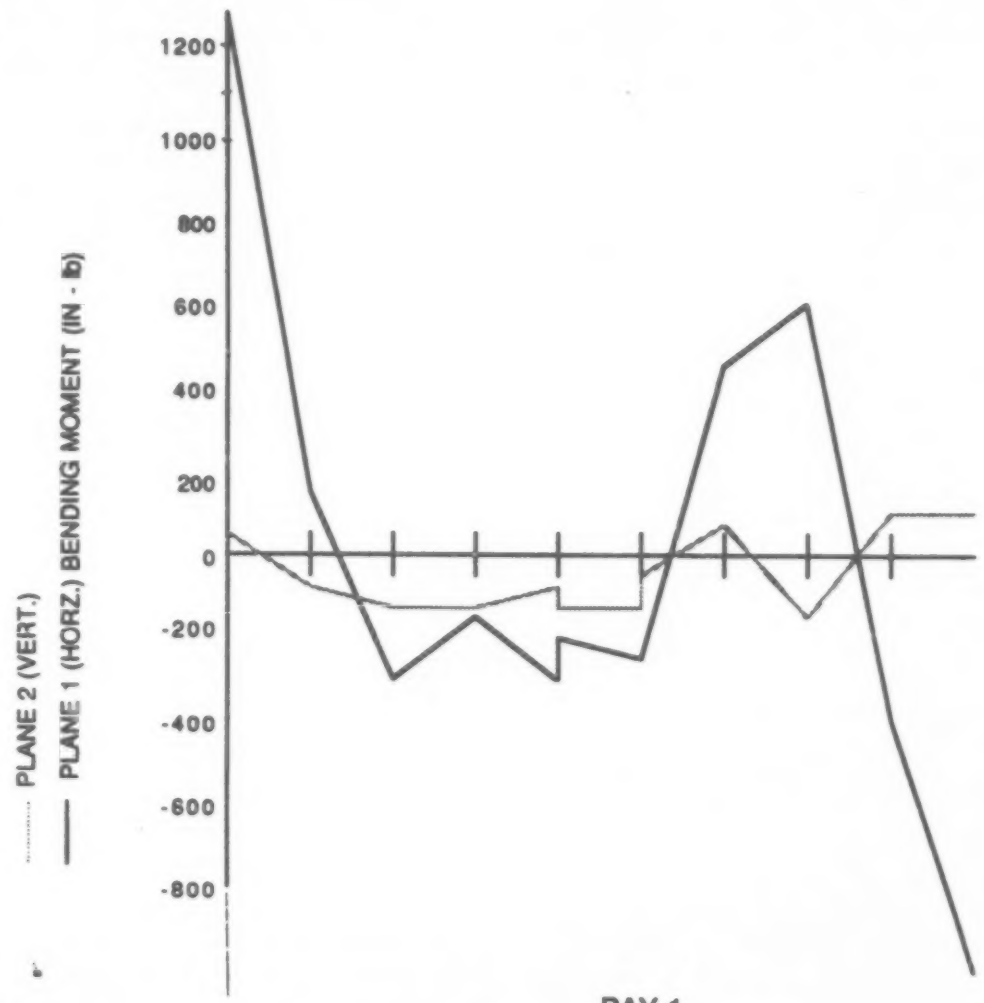
## 5.6 CYLINDER RING ANALYSIS (CONT'D)

### REGULAR LANDING LOADS

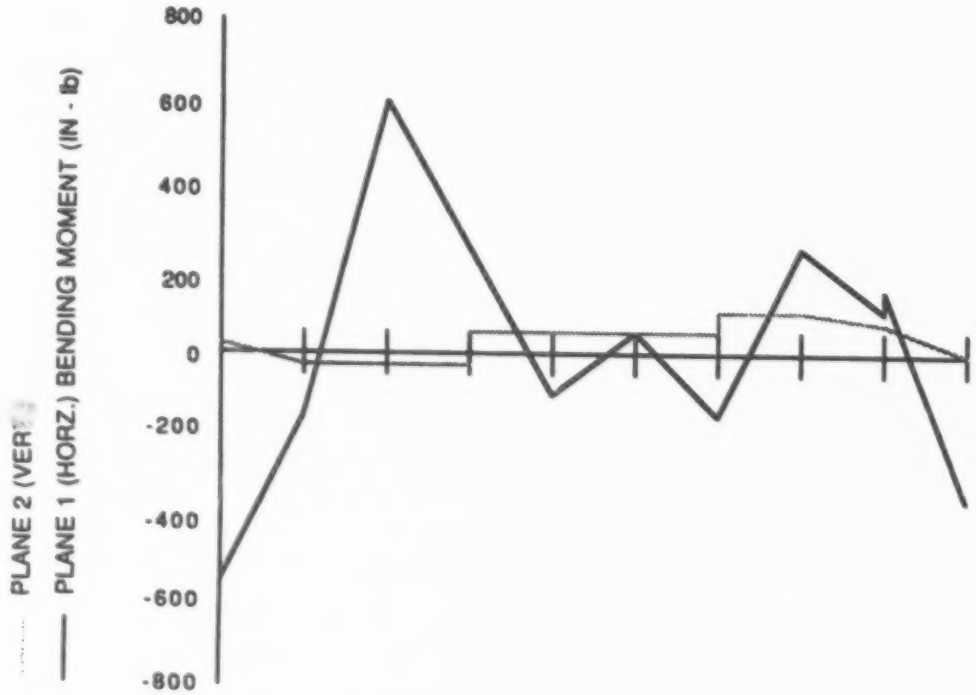
### TOP RING



## 5.6 CYLINDER RING ANALYSIS (CONT'D)

### REGULAR LANDING LOADS

### TOP RING




BAY 2

| Prepared by: D.E. KIEFLING | Date 7/12/88 | LOCKHEED MISSILES & SPACE COMPANY, INC. | Page 5.C.19 Temp Perm |
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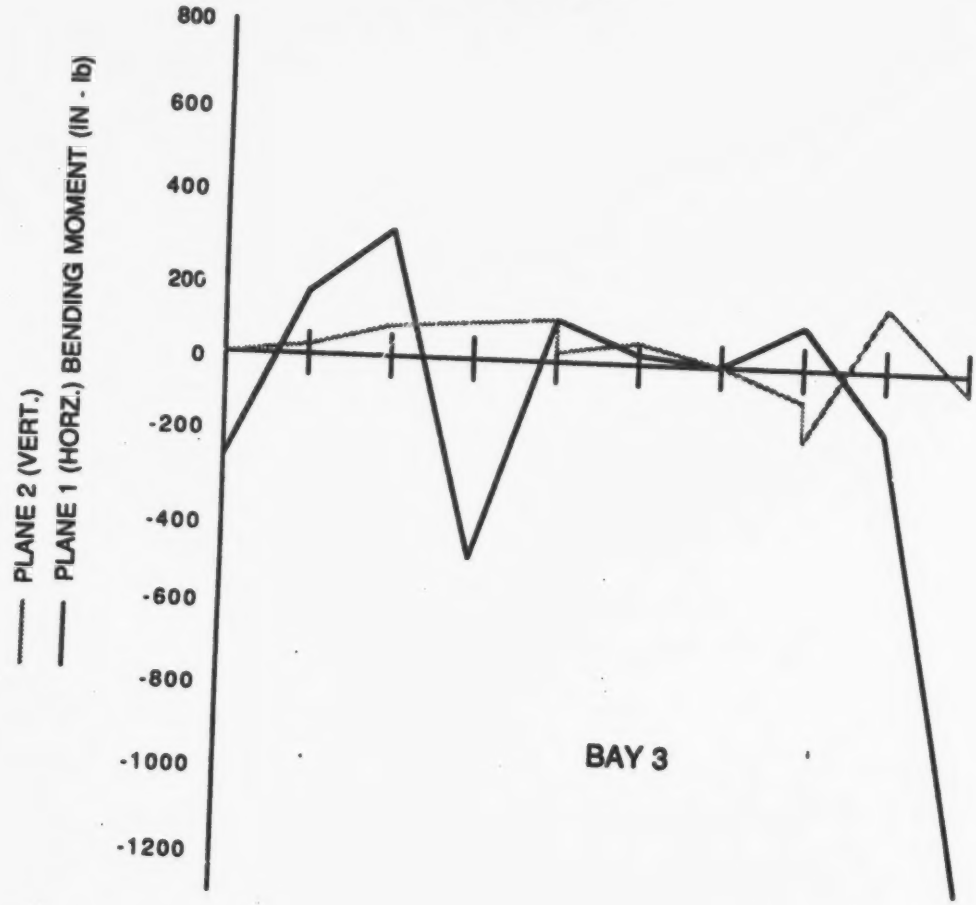
5.6 **CYLINDER RING ANALYSIS** (CONT'D)
**REGULAR LANDING LOADS**
**TOP RING**




C-5

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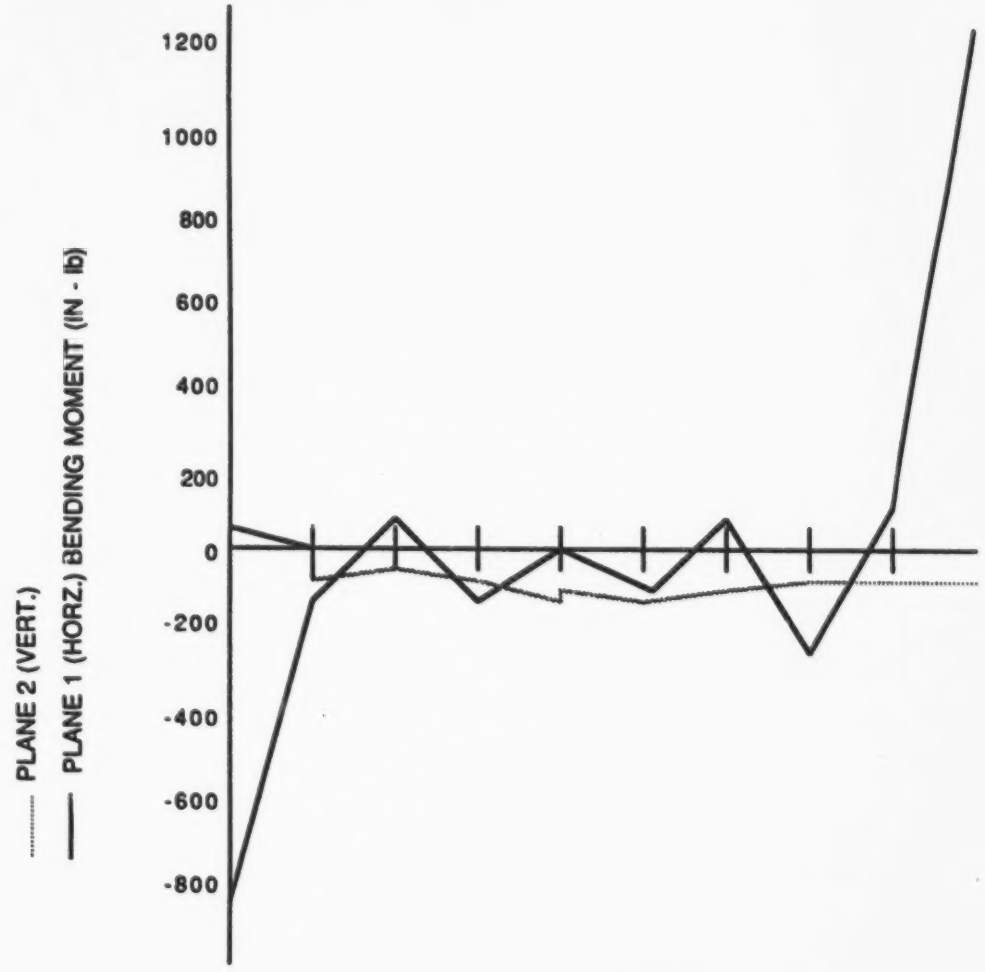
## 5.6 CYLINDER RING ANALYSIS (CONT'D.)
## REGULAR LANDING LOADS
## TOP RING



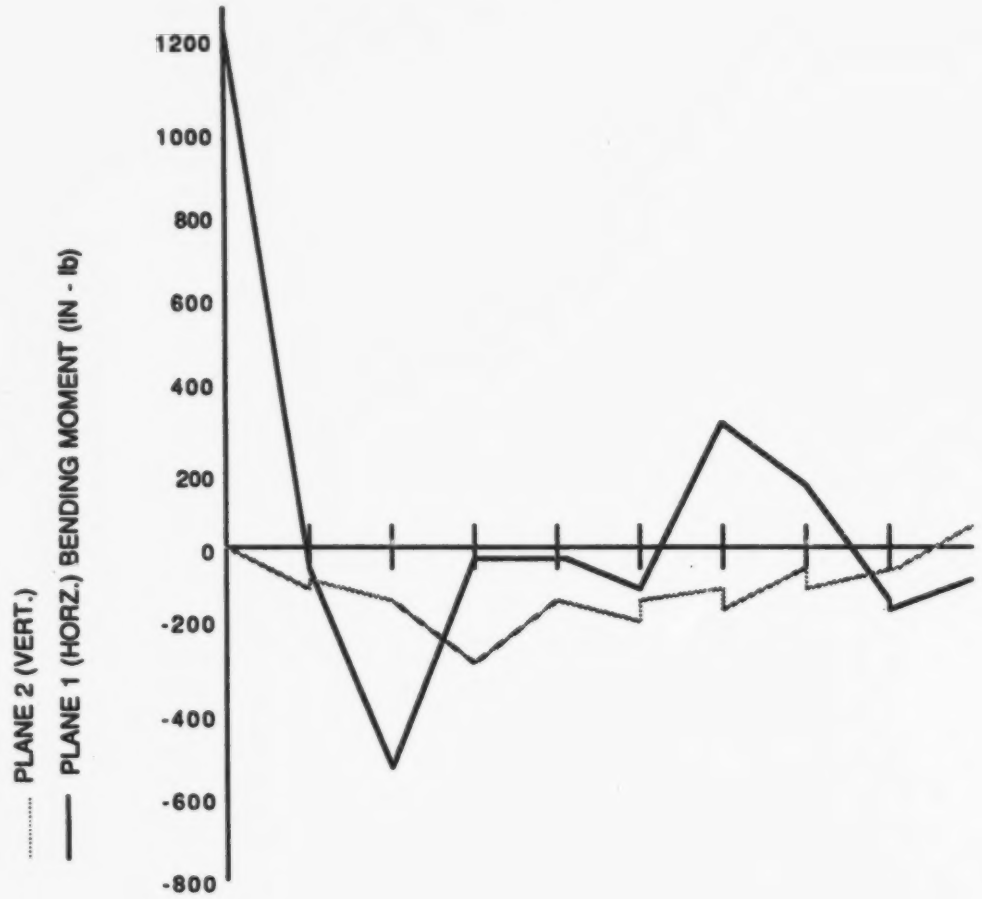

BAY 4

FORM LMSC 362 B-3

## 5.6 CYLINDER RING ANALYSIS (CONT'D)

### REGULAR LANDING LOADS

### TOP RING




BAY 5

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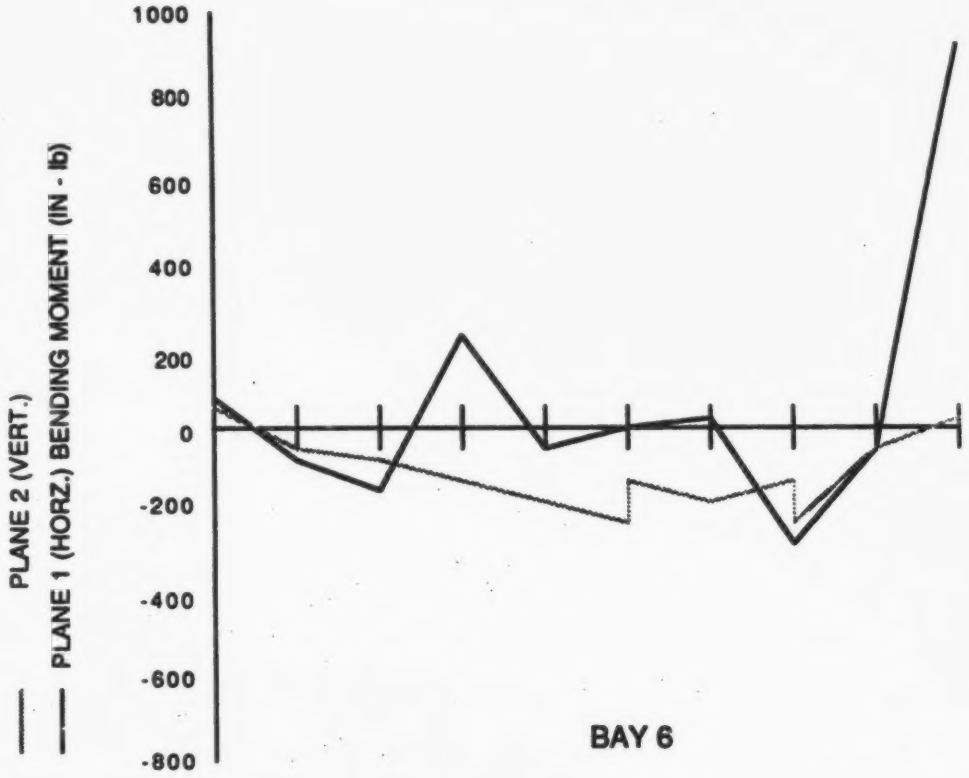
## 5.6 CYLINDER RING ANALYSIS
## REGULAR LANDING LOADS
## TOP RING

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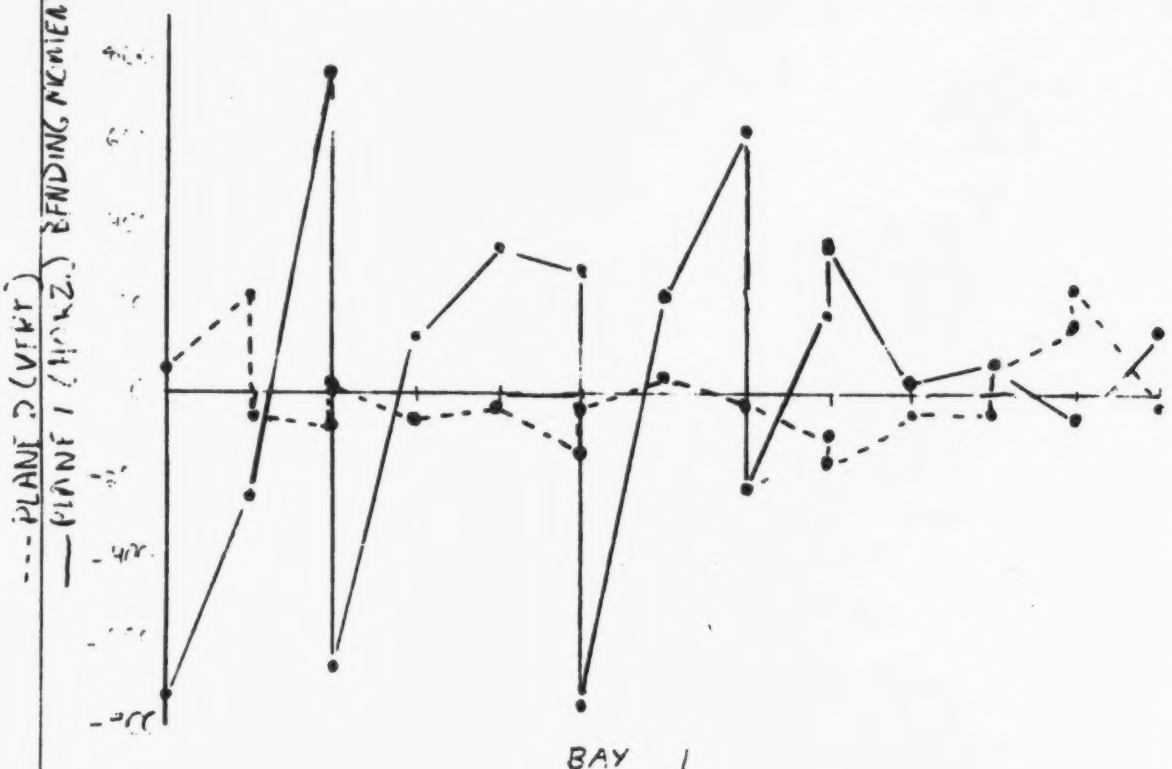
5.6 CYLINDER RING ANALYSIS (CONT'D)

LIFTOFF LOADS

BOTTOM RING

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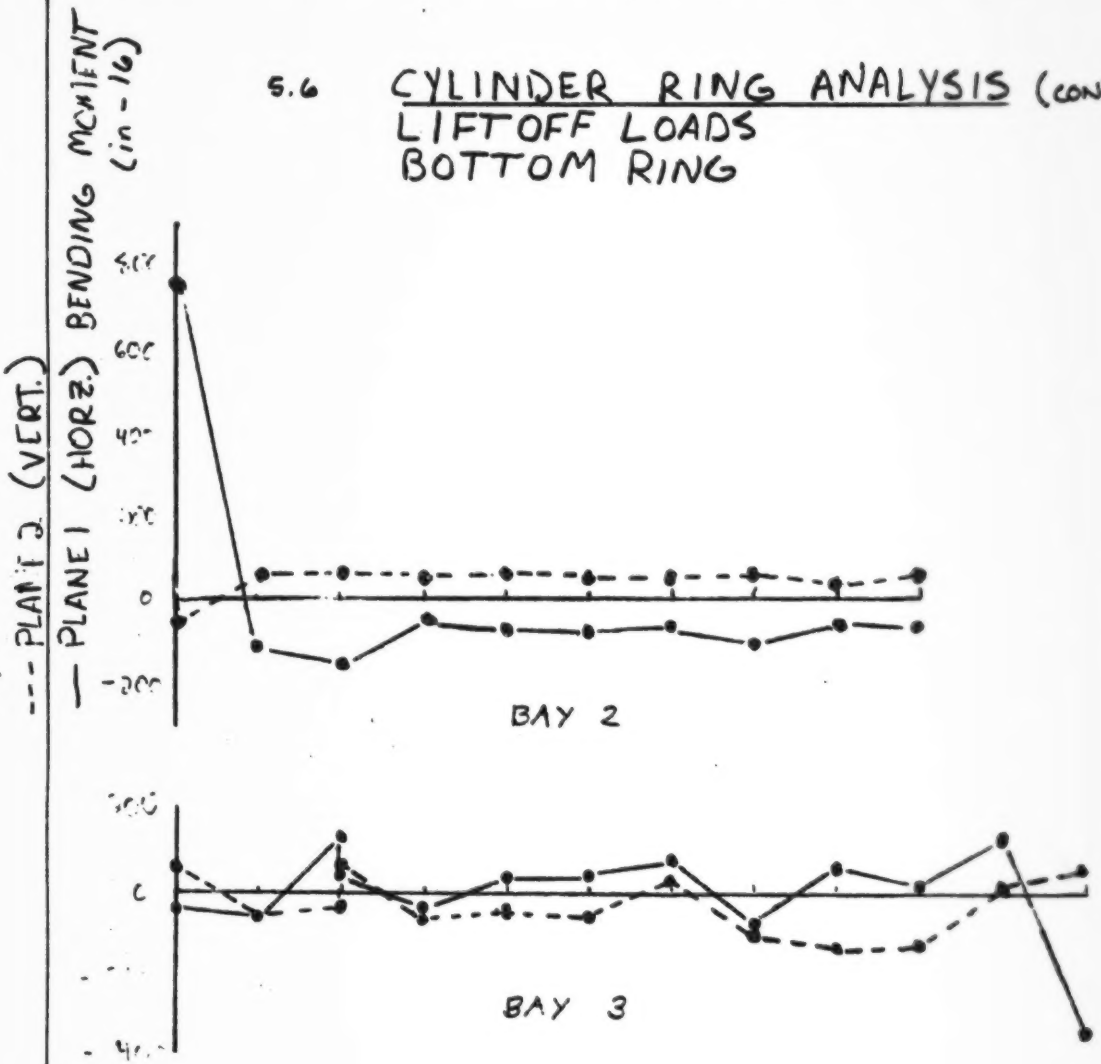
## 5.6 CYLINDER RING ANALYSIS (CONT'D)

LIFTOFF LOADS
BOTTOM RING

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## 5.6 CYLINDER RING ANALYSIS (CONT'D)

LIFTOFF LOADS

BOTTOM RING

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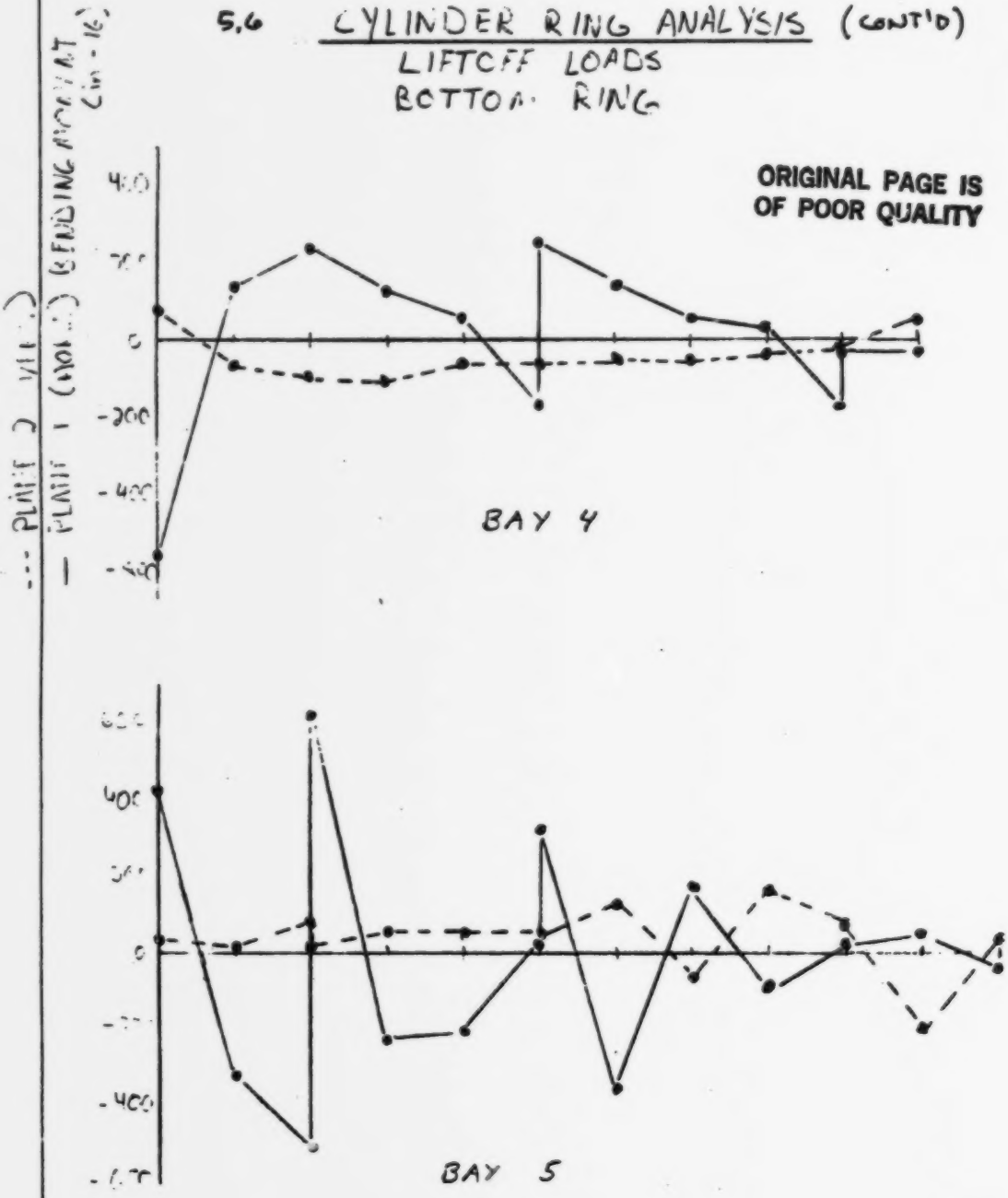
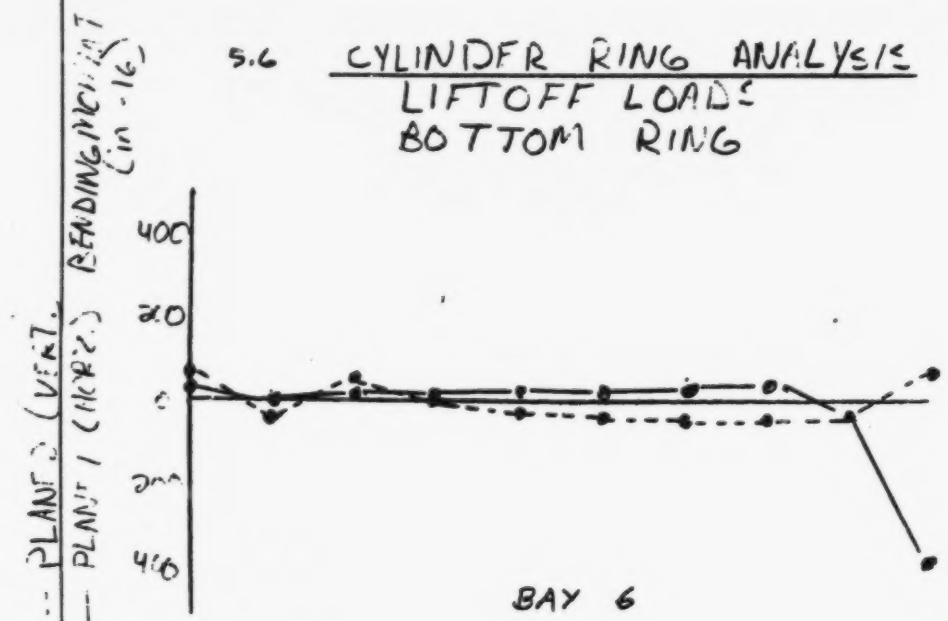


5.6 CYLINDER RING ANALYSIS (CONT'D)

LIFTOFF LOADS

BOTTOM RING

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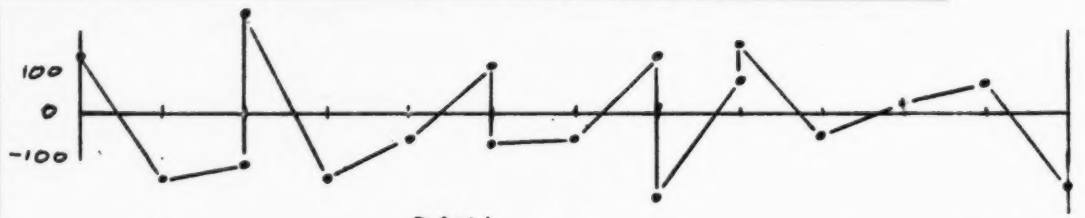
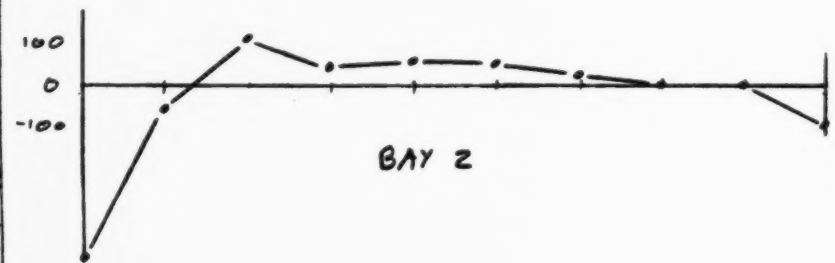
LANDING ABORT LOAD CASE, BOTTOM CYLINDER RING PLANE 1 MOMENTS VS. RING ELEMENTS

PLANE 1 BENDING MOMENTS (in-lb)

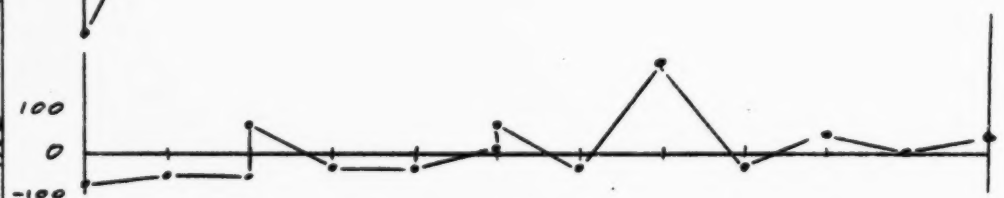



BAY 1




BAY 2

NOTE: HORIZONTAL AXIS REFERS TO NO. OF ELEMENTS PER BAY, NOT TO LENGTH SCALE

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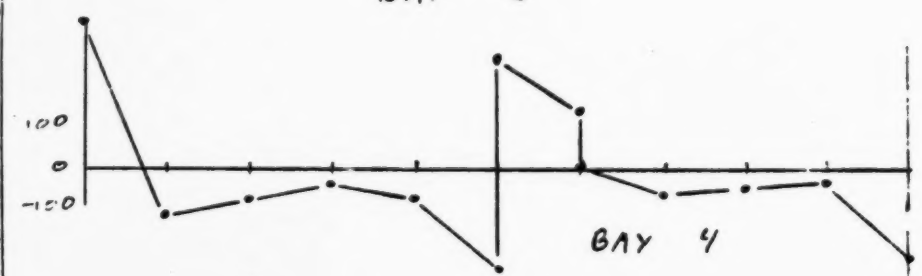


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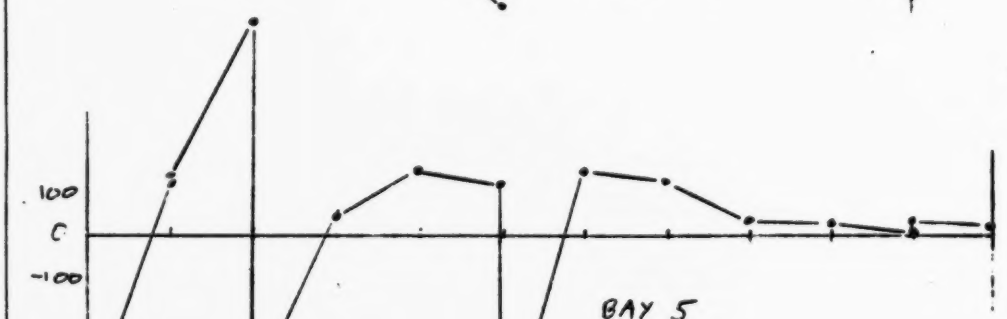


BAY 5

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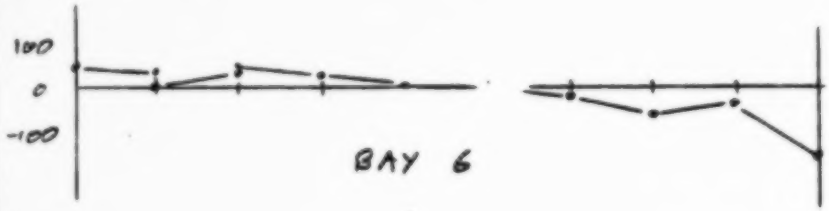
FORM LMSC 383 B3

LANDING ABORT LOAD CASE, BOTTOM RING

PLANE 1 MOMENTS VS. RING ELEMENTS (CONT'D)

PLANE 1 MOMENTS (in-lbs)

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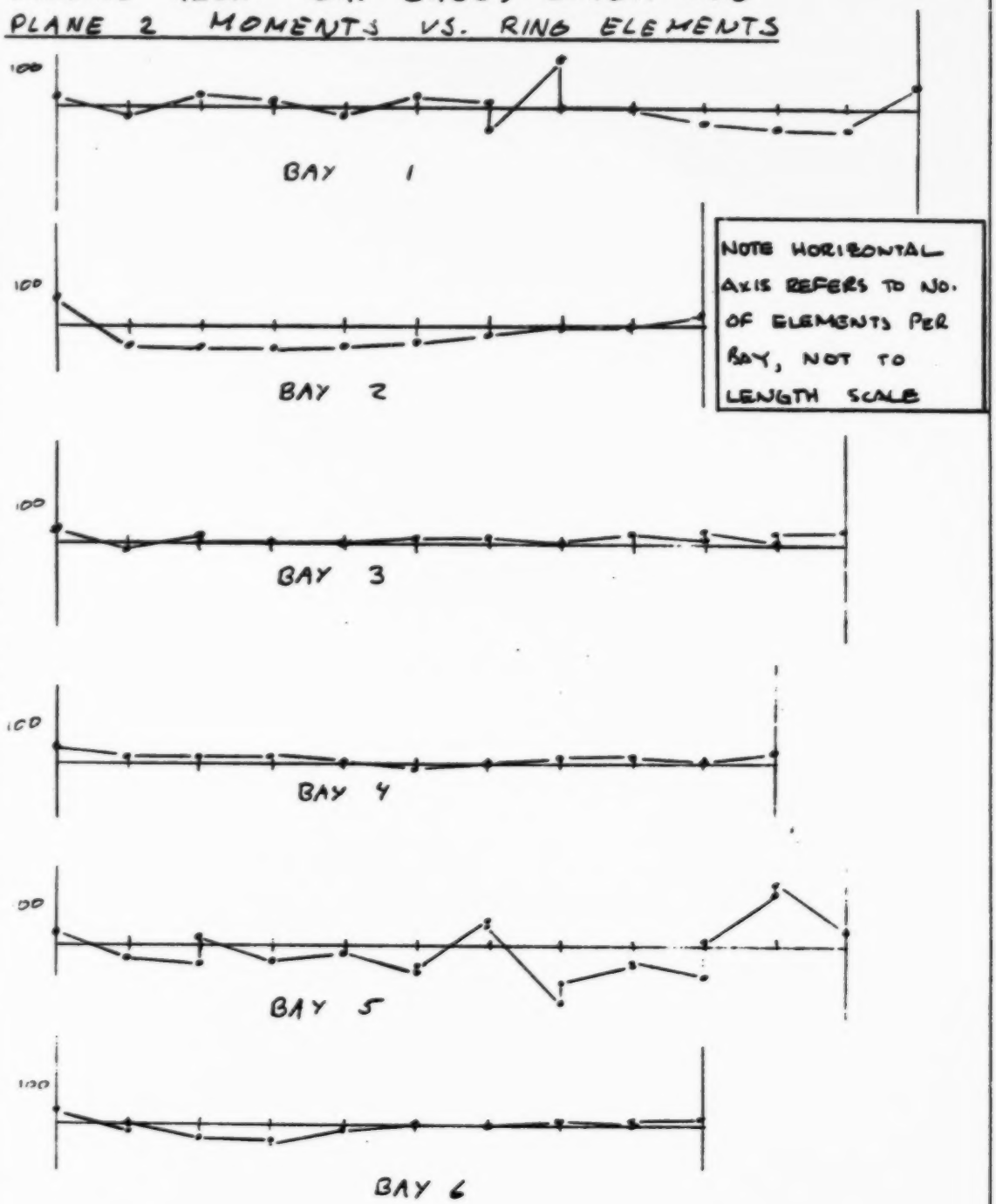
LANDING ABORT LOAD CASE, BOTTOM RING

PLANE 2 MOMENTS VS. RING ELEMENTS




NOTE HORIZONTAL AXIS REFERS TO NO. OF ELEMENTS PER BAY, NOT TO LENGTH SCALE

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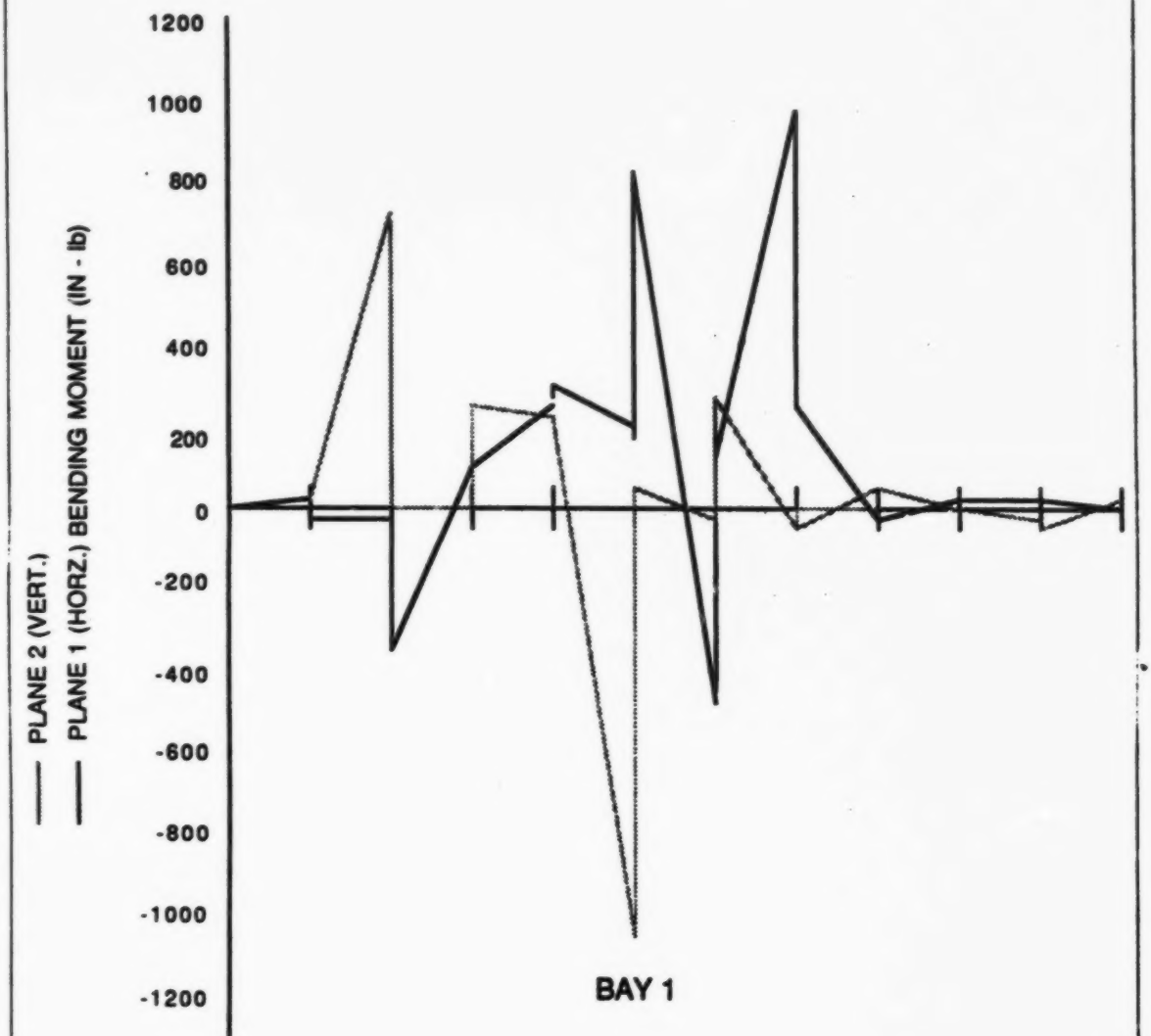
5.6 **CYLINDER RING ANALYSIS** (CONT'D)

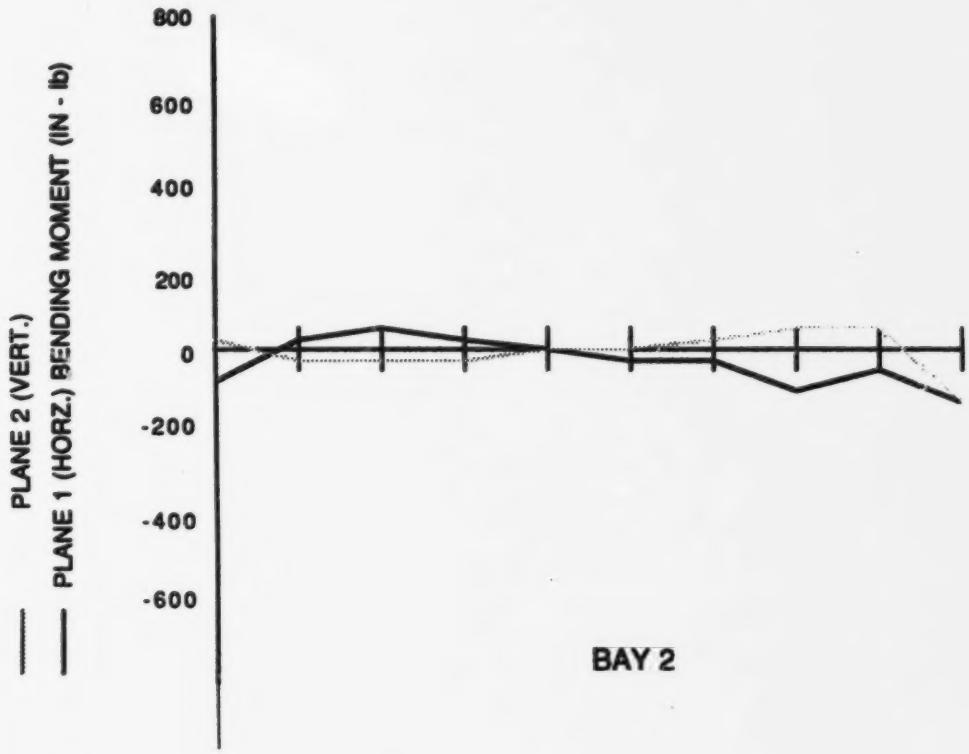
**REGULAR LANDING LOADS**

**BOTTOM RING**




FORM LMSC 362 B-3

## 5.6 CYLINDER RING ANALYSIS (CONT'D)
## REGULAR LANDING LOADS
## BOTTOM RING

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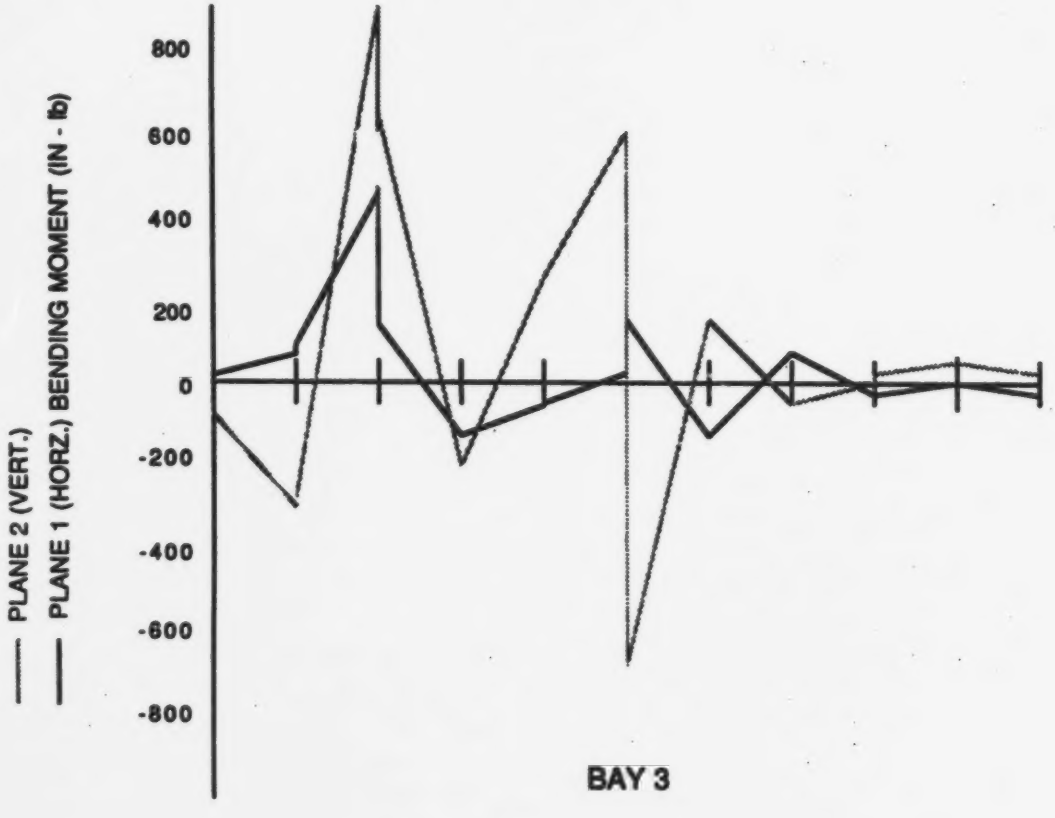
## 5.6 CYLINDER RING ANALYSIS (CONT'D)

## REGULAR LANDING LOADS

## BOTTOM RING

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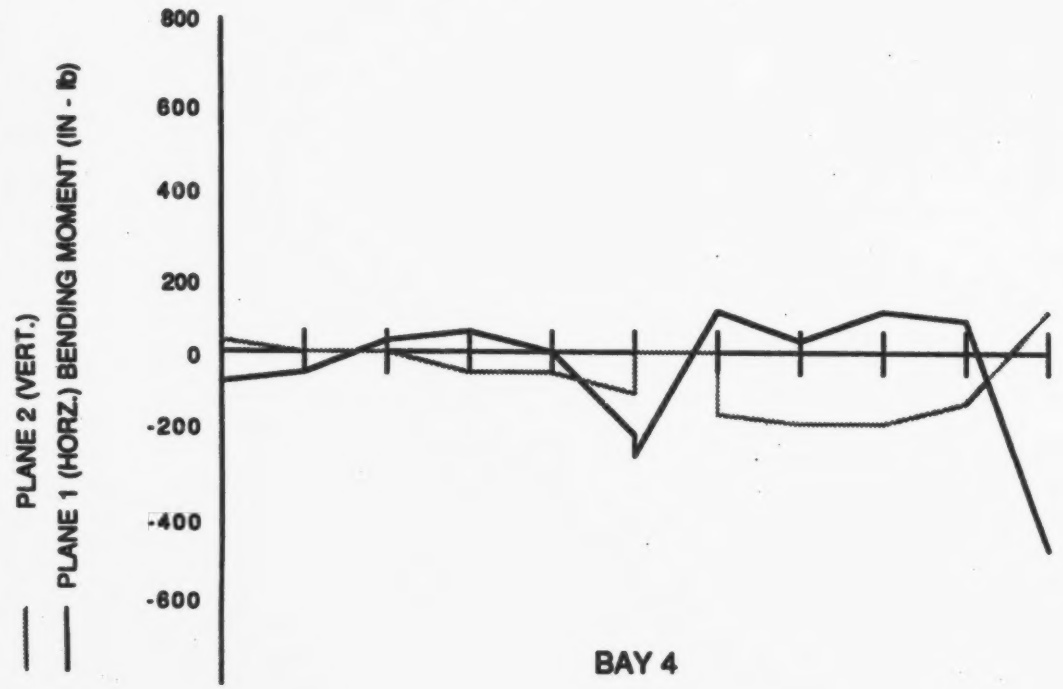
## 5.6 CYLINDER RING ANALYSIS (CONT'D)
## REGULAR LANDING LOADS
## BOTTOM RING

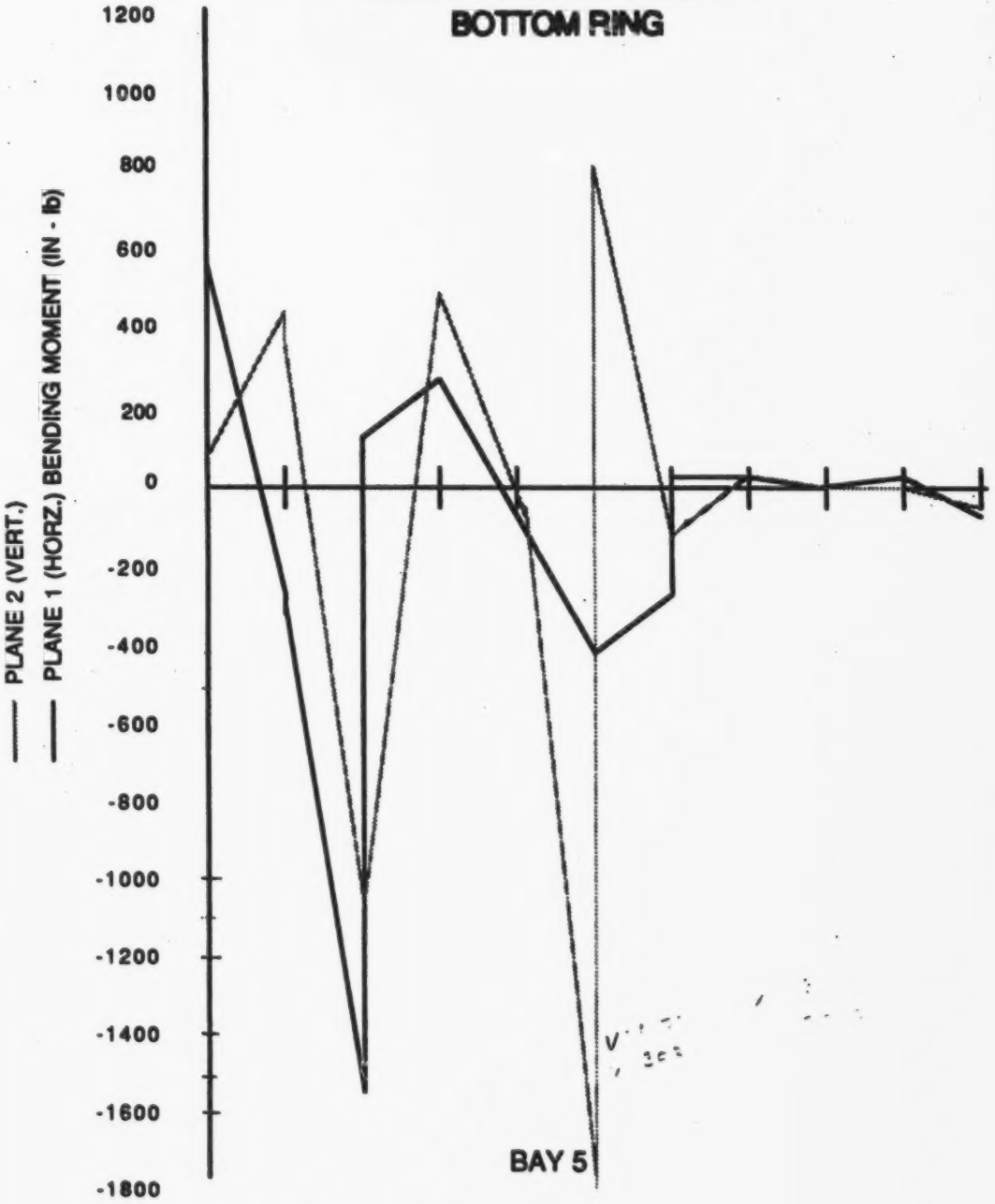


| Prepared by: | Date | LOCKHEED MISSILES & SPACE COMPANY, INC. | Page |
|---|---|---|---|
| D.E. KIEFLING | 7/12/88 | | 5.6.34 |
| Checked by: | Date | Title | Model |
| | | AFE CARRIER VEHICLE | AFE-CV |
| Approved by: | Date | STRESS ANALYSIS | Report No. |
| | | | |

## 5.6 CYLINDER RING ANALYSIS (CONT'D)

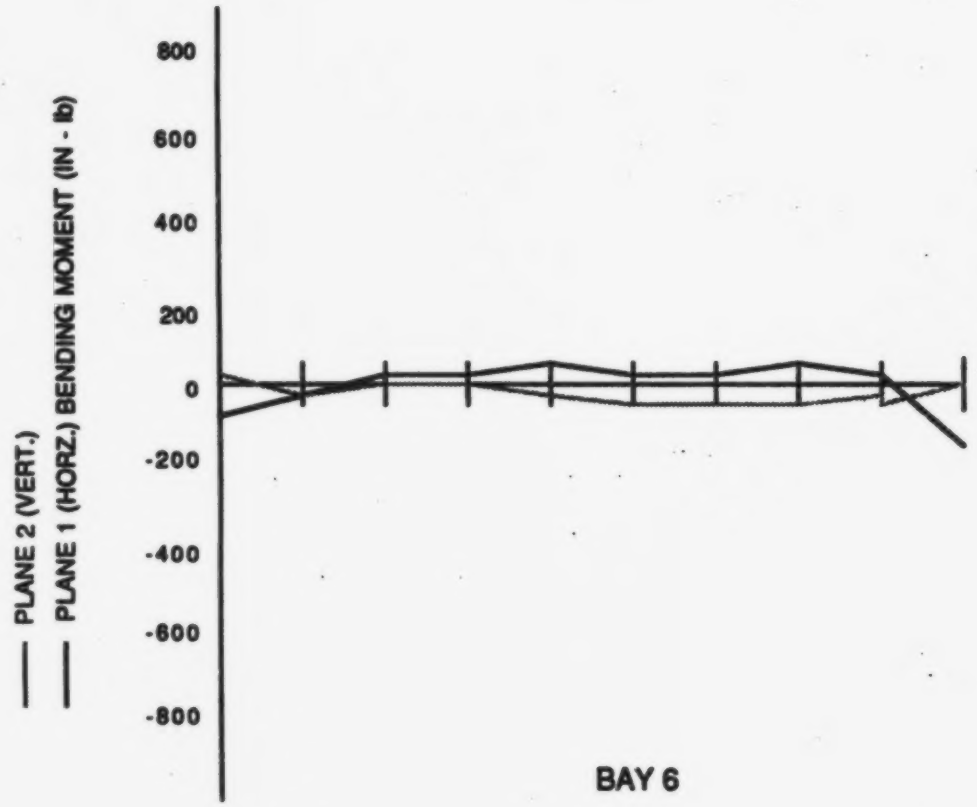
### REGULAR LANDING LOADS

### BOTTOM RING



| Prepared by: D.E. KIEFLING | Date 7/12/88 | LOCKHEED MISSILES & SPACE COMPANY, INC. | Page 5.6.35 |
|---|---|---|---|
| Checked by: | Date | Title AFE CARRIER VEHICLE STRESS ANALYSIS | Model AFE-CV |
| Approved by: | Date | | Report No. |

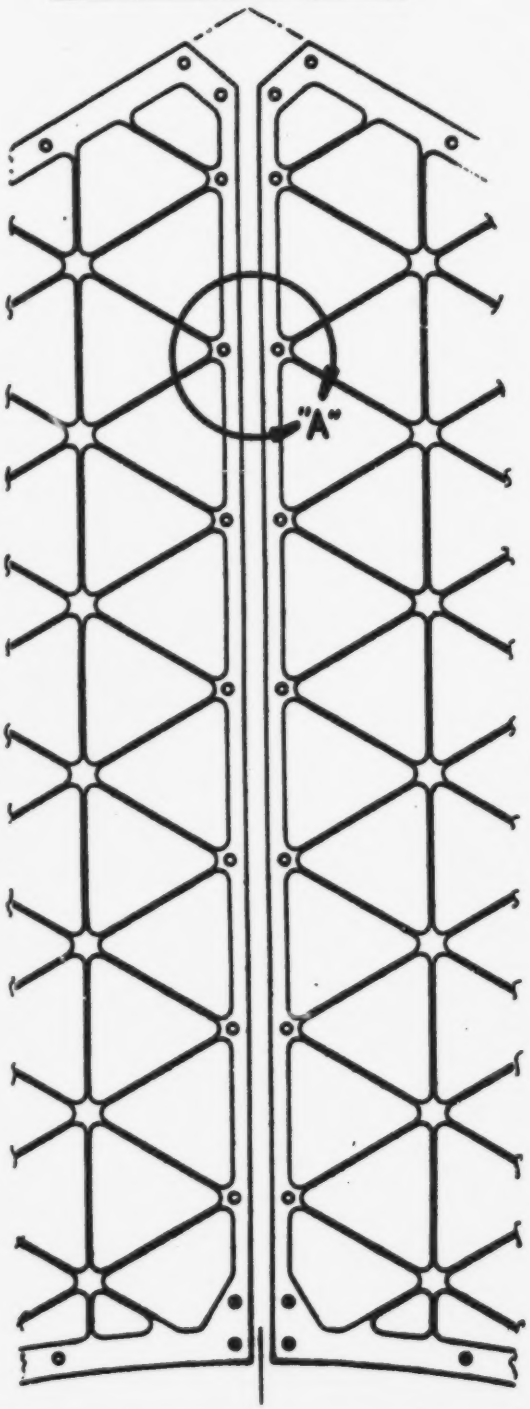
## 5.6 CYLINDER RING ANALYSIS (CONT'D)
## REGULAR LANDING LOADS
## BOTTOM RING



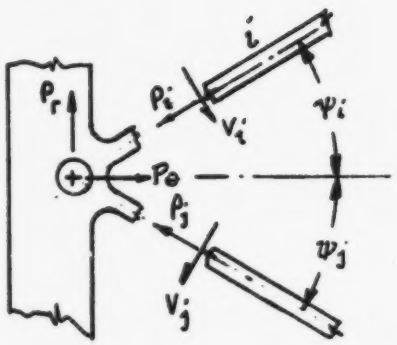
| Prepared by: INGRAM | Date 6-24-88 | LOCKHEED MISSILES & SPACE COMPANY, INC. | Page 5.7.1 |
|---|---|---|---|
| Checked by: | Date | Title: AFE CARRIER VEHICLE STRESS ANALYSIS | Model: AFE CV |
| Approved by: | Date | | Report No. |

## 5.7 PANEL SPLICE ANALYSIS

TYPICAL PANEL SPLICE :




DETAIL "A" :




AT EACH NODE :

$$P_\theta = P_i \cos\psi_i - V_i \sin\psi_i + P_j \cos\psi_j + V_j \sin\psi_j$$

$$P_r = P_i \sin\psi_i + V_i \cos\psi_i - P_j \sin\psi_j + V_j \cos\psi_j$$

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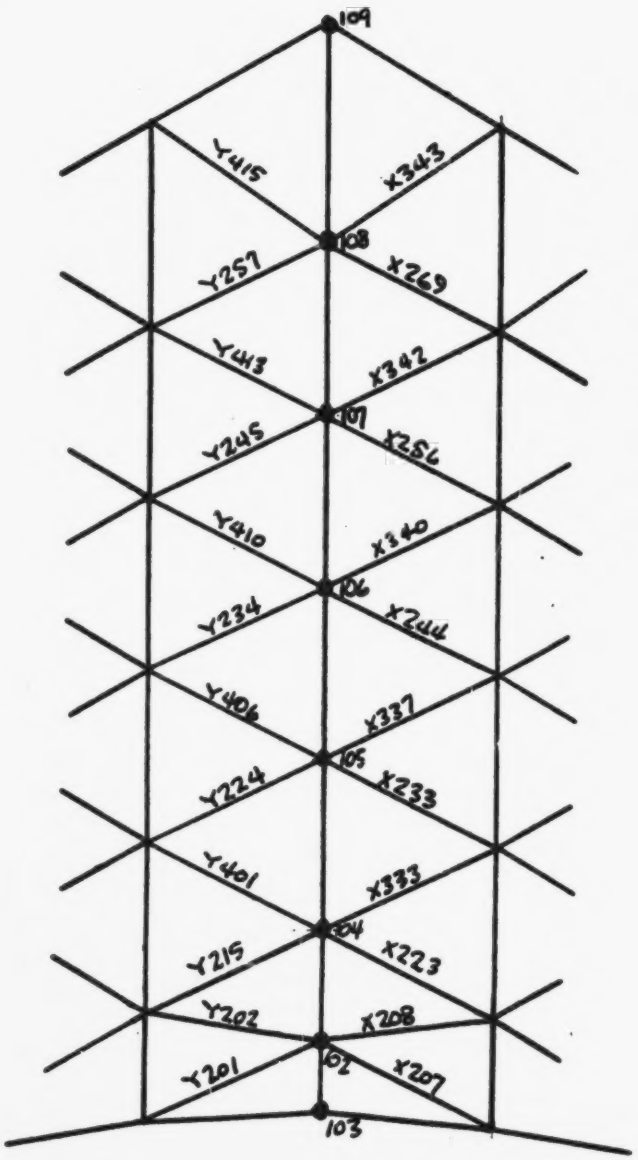
| Prepared by: INGRAM | Date 6-27-83 | LOCKHEED MISSILES & SPACE COMPANY, INC. | Page 5.7.2 |
|---|---|---|---|
| Checked by: | Date | Title AFE CARRIER VEHICLE STRESS ANALYSIS | Model AFE-CV |
| Approved by: | Date | | Report No. |

5.7 PANEL SPLICE ANALYSIS (CONT'D)

- NASTRAN MODEL DETAILS AT TYPICAL LOWER PANEL SPLICE



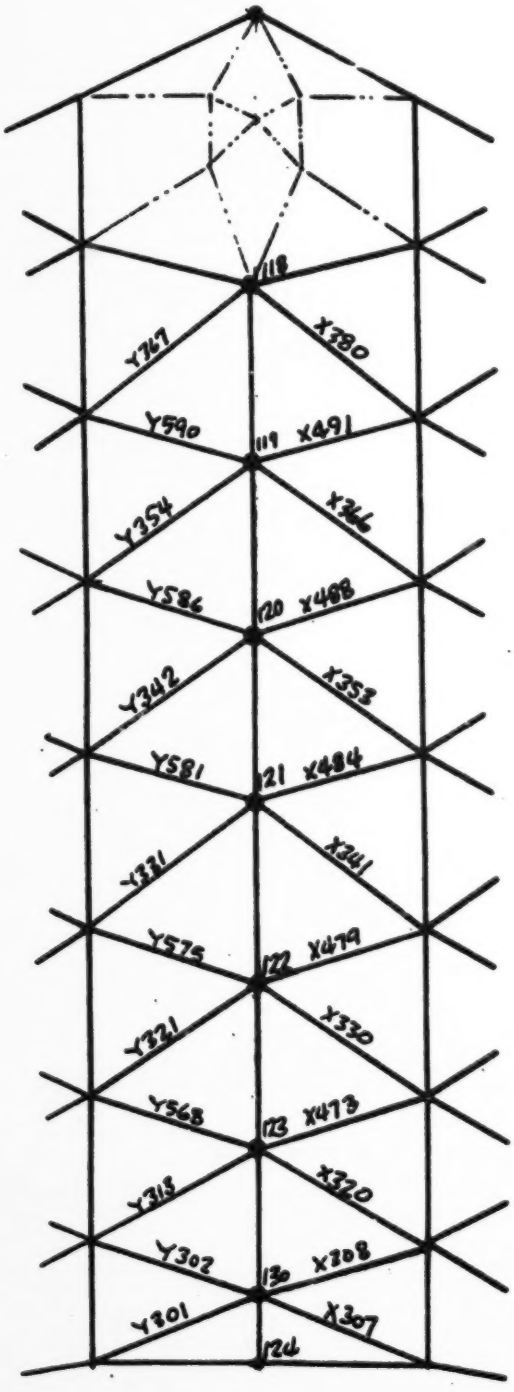

X, Y = LOWER PANEL BAY NOS.

FORM LMSC 362 B-3

| Prepared by: INGRAM | Date 6-27-88 | LOCKHEED MISSILES & SPACE COMPANY, INC. | Page 5.73 |
|---|---|---|---|
| Checked by: | Date | Title: AFE CARRIER VEHICLE STRESS ANALYSIS | Model: AFE-CV |
| Approved by: | Date | | Report No. |

5.7 PANEL SPLICE ANALYSIS (CONT'D)

- NASTRAN MODEL DETAILS AT TYPICAL UPPER PANEL SPLICE

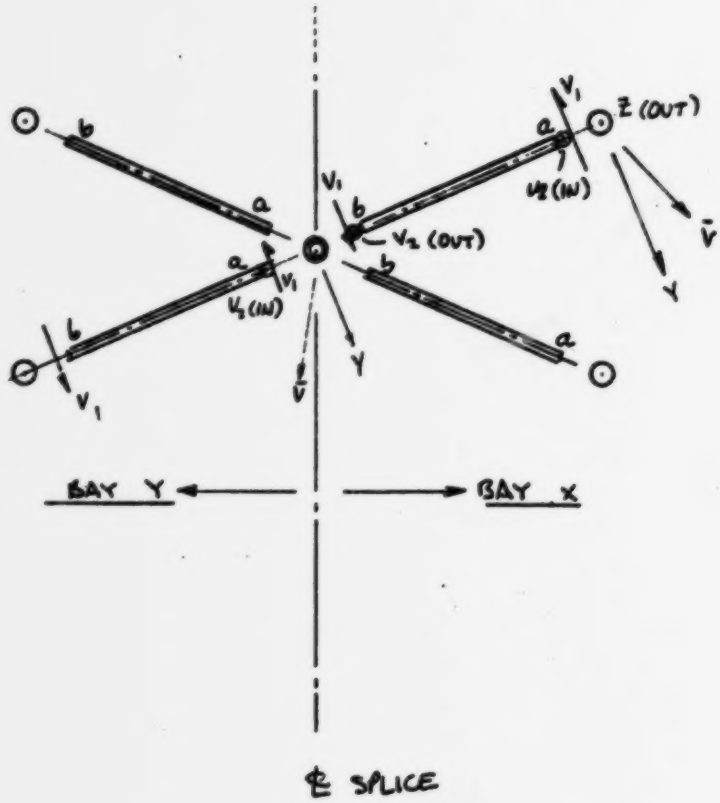



X, Y = UPPER PANEL BAY NOS.

FORM LMSC 2218-3

5.7 PANEL SPLICE ANALYSIS (CONT'D)

- NASTRAN BAR FORCE SIGN CONVENTION
- POSITIVE BAR FORCES SHOWN FOR PANEL ISOGRID BARS

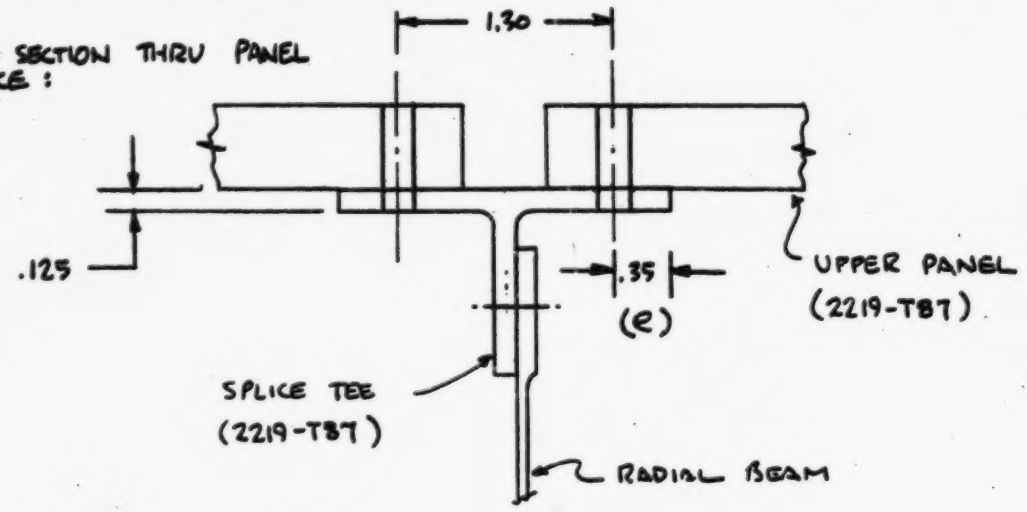



ALL ISOGRID BAR ELEMENTS IN THE AFE CV NASTRAN MODEL ARE SPECIFIED AS SHOWN ABOVE, WHERE ENDS a AND b REFER TO THE ORDER OF THE GRIDPOINTS SPECIFYING THE CONNECTIVITY OF THE BAR. THE ORDER (a, b) AND A VECTOR, $\bar{V}$ DETERMINE THE DIRECTION OF POSITIVE BAR FORCES. (SEE FIG 1, PG. 1.3-15 OF COSMIC NASTRAN USERS' MANUAL)

## 5.7 PANEL SPLICE ANALYSIS (CONT'D)

### - FASTENER ALLOWABLES

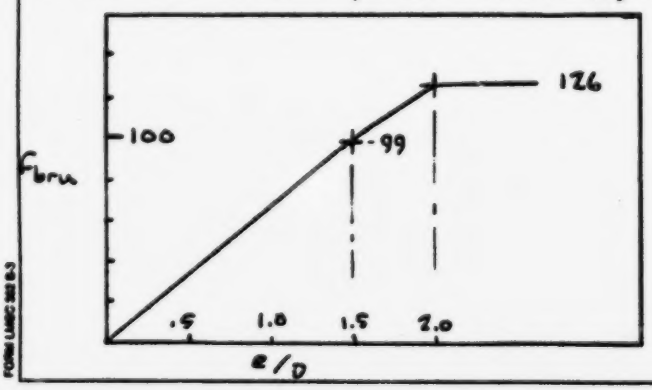
CROSS SECTION THRU PANEL SPLICE :




FASTIR BEARING, SHEAR & TENSION ALLOWABLES :

| PIN DIA (IN) | * e/D | * $F_{bru}$ (KSI) | Δ $P_{bru}$ (K) | Δ $P_{su}$ (K) | $P_{tu}$ (K) |
|---|---|---|---|---|---|
| .188 | 1.86 | 118 | 2,773 | 2,637 | 2900 |
| .250 | 1.40 | 92 | 2.875 | 4.663 | 4300 |
| .312 | 1.12 | 74 | 2.886 | 7.263 | 6300 |

* REF MIL-HDBK-5C, TABLE 3.2.C.0(6):




Δ $P_{bru} = D \cdot t \cdot F_{bru}$

Δ $P_{su} = \frac{\pi D^2}{4} (F_{su}^{**})$

** ASSUME 95 KSI SHEAR BOLT

FORM LMSC 363 B-3

5.7 PANEL SPLICE ANALYSIS (CONT'D)

BAY 1 TO BAY 2 UPPER PANEL SPLICE FASTENER MARGINS OF SAFETY

LIFTOFF CONDITION

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GRID POINT | BAR NUMBER | ANGLE "RB" | SIDE SHEAR | VERT. SHEAR | AXIAL FORCE | THETA FORCE | RADIAL FORCE | RES. SHEAR | TENSILE FORCE | SHEAR RATIO, Rs | TENSION RATIO, Rt | M.S. |
| 2 | | | 0.017453 | V1 - (LB) | V2 - (LB) | P - (LB) | | | | | | | |
| 3 | BAY 1 SIDE: | | | | | | | | | | | | |
| 4 | | 13401 | 10 | 0.000 | -0.003 | -60.200 | | | | | | | |
| 5 | 110 | | | | | | -40.310 | -29.350 | 49.870 | 0.140 | 0.021 | 0.000 | 318.540 |
| 6 | | 13300 | 30 | -0.012 | 0.143 | 21.700 | | | | | | | |
| 7 | | | | | | | | | | | | | |
| 8 | | 13400 | 10 | -0.010 | 0.710 | -75.200 | | | | | | | |
| 9 | 120 | | | | | | -39.041 | -44.012 | 50.500 | 0.007 | 0.020 | 0.000 | 243.[illegible] |
| 10 | | 13303 | 30 | -0.010 | 0.000 | 41.100 | | | | | | | |
| 11 | | | | | | | | | | | | | |
| 12 | | 13404 | 10 | -0.020 | 0.023 | 90.000 | | | | | | | |
| 13 | 121 | | | | | | 127.224 | -0.700 | 127.403 | 60.423 | 0.050 | 0.041 | 22.221 |
| 14 | | 13341 | 30 | -0.017 | 0.423 | 52.700 | | | | | | | |
| 15 | | | | | | | | | | | | | |
| 16 | | 13470 | 10 | -0.020 | 0.100 | -95.300 | | | | | | | |
| 17 | 122 | | | | | | -43.070 | -60.000 | 75.134 | 0.007 | 0.033 | 0.000 | 171.500 |
| 18 | | 13330 | 30 | -0.010 | 0.510 | 50.000 | | | | | | | |
| 19 | | | | | | | | | | | | | |
| 20 | | 13473 | 10 | -0.031 | 0.033 | -62.000 | | | | | | | |
| 21 | 123 | | | | | | -40.003 | -53.000 | 67.707 | 0.047 | 0.020 | 0.000 | 200.000 |
| 22 | | 13320 | 31 | -0.010 | 0.010 | 65.000 | | | | | | | |
| 23 | | | | | | | | | | | | | |
| 24 | | 13300 | 10 | -0.030 | 0.007 | -52.000 | | | | | | | |
| 25 | 130 | | | | | | 20.400 | -45.040 | 52.047 | 1.000 | 0.023 | 0.001 | 200.020 |
| 26 | | 13307 | 22 | 0.007 | 0.000 | 63.400 | | | | | | | |
| 27 | | | | | | | | | | | | | |
| 28 | BAY 2 SIDE: | | | | | | | | | | | | |
| 29 | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| 31 | | 23400 | 10 | 0.030 | 0.210 | -127.000 | | | | | | | |
| 32 | 110 | | | | | | -20.134 | -100.002 | 110.040 | -0.003 | 0.040 | 0.000 | 95.400 |
| 33 | | 23304 | 30 | 0.033 | -0.270 | 120.000 | | | | | | | |
| 34 | | | | | | | | | | | | | |
| 35 | | 23500 | 10 | 0.003 | -80.000 | -170.000 | | | | | | | |
| 36 | 120 | | | | | | -110.700 | -60.000 | 142.003 | -95.004 | 0.001 | 0.040 | 20.231 |
| 37 | | 23343 | 30 | 0.000 | 0.700 | 71.000 | | | | | | | |
| 38 | | | | | | | | | | | | | |
| 39 | | 23501 | 10 | 0.070 | -1.010 | -201.000 | | | | | | | |
| 40 | 121 | | | | | | -112.330 | -114.100 | 160.110 | 0.300 | 0.000 | 0.000 | 54.543 |
| 41 | | 23331 | 30 | 0.000 | 1.400 | 100.000 | | | | | | | |
| 42 | | | | | | | | | | | | | |
| 43 | | 23570 | 10 | 0.000 | -0.531 | -211.000 | | | | | | | |
| 44 | 122 | | | | | | -37.704 | -177.044 | 181.011 | -1.100 | 0.070 | 0.001 | 44.070 |
| 45 | | 23321 | 30 | 0.040 | -0.020 | 204.000 | | | | | | | |
| 46 | | | | | | | | | | | | | |
| 47 | | 23500 | 10 | 0.003 | 0.400 | -200.000 | | | | | | | |
| 48 | 123 | | | | | | -71.373 | -134.404 | 152.233 | 0.520 | 0.000 | 0.000 | 50.031 |
| 49 | | 23313 | 31 | 0.030 | 0.110 | 150.000 | | | | | | | |
| 50 | | | | | | | | | | | | | |
| 51 | | 23303 | 10 | -0.023 | 0.100 | 170.000 | | | | | | | |
| 52 | 130 | | | | | | 310.400 | -10.203 | 310.053 | 0.000 | 0.137 | 0.000 | 10.000 |
| 53 | | 23301 | 22 | -0.010 | -0.100 | 150.000 | | | | | | | |

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Checked by: Date

Approved by: Date

LOCKHEED MISSILES & SPACE COMPANY, INC.

Title: AFE CARRIER VEHICLE STRESS ANALYSIS

Page 5.7.6 Form

Model AFE CV

Report No.

5.7 PANEL SPLICE ANALYSIS (CONT'D)

BAY 2 TO BAY 3 UPPER PANEL SPLICE FASTENER MARGINS OF SAFETY

LIFTOFF CONDITION

| A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | M.S. |
| | | 0.017453 | V1 - LB | V2 - LB | P - LB | | | | | | | |
| BAY 2 SIDE: | | | | | | | | | | | | |
| | 22401 | 16 | -7.141E-02 | 8.906E-01 | 3.006E+01 | | | | | | | |
| 118 | | | | | | 99.006 | -8.132 | 98.290 | 0.000 | 0.002 | 0.000 | 300.667 |
| | 22366 | 20 | 3.236E-02 | -9.488E-02 | 3.411E+01 | | | | | | | |
| | 22406 | 16 | -7.478E-02 | 1.411E+00 | 6.105E+01 | | | | | | | |
| 120 | | | | | | 99.237 | -16.185 | 98.516 | 81.181 | 0.008 | 0.024 | 38.018 |
| | 22365 | 36 | 4.858E-02 | 1.811E-01 | 4.978E+01 | | | | | | | |
| | 22404 | 16 | -8.808E-02 | 1.096E+00 | 6.882E+01 | | | | | | | |
| 121 | | | | | | 123.006 | -22.033 | 120.000 | 88.896 | 0.004 | 0.031 | 27.000 |
| | 22341 | 36 | 4.098E-02 | 7.808E-01 | 7.186E+01 | | | | | | | |
| | 22478 | 16 | -1.141E-02 | 1.372E+00 | 8.828E+01 | | | | | | | |
| 122 | | | | | | 160.000 | -38.081 | 182.281 | 2.779 | 0.078 | 0.001 | 33.318 |
| | 22328 | 36 | 8.748E-02 | 1.400E+00 | 1.806E+02 | | | | | | | |
| | 22477 | 16 | -1.018E-02 | 1.438E+00 | 1.806E+02 | | | | | | | |
| 123 | | | | | | 228.488 | -38.898 | 224.098 | 3.630 | 0.090 | 0.000 | 32.037 |
| | 22326 | 31 | -4.081E-02 | 2.104E+00 | 1.308E+02 | | | | | | | |
| | 22306 | 16 | -3.418E-02 | 8.808E-01 | 8.738E+01 | | | | | | | |
| 120 | | | | | | 83.838 | 24.008 | 87.298 | 0.000 | 0.037 | 0.000 | 180.077 |
| | 22307 | 31 | | | | | | | | | | |
| BAY 3 SIDE: | | | | | | | | | | | | |
| | 22406 | 16 | 8.058E-02 | -8.098E-01 | 2.478E+01 | | | | | | | |
| 118 | | | | | | 87.898 | -14.898 | 89.731 | -9.418 | 0.058 | 0.000 | 189.424 |
| | 22384 | 20 | -1.878E-02 | 1.808E-01 | 6.178E+01 | | | | | | | |
| | 22408 | 16 | 1.318E-02 | -1.008E+00 | 3.808E+01 | | | | | | | |
| 120 | | | | | | 98.436 | -20.843 | 90.298 | -0.074 | 0.041 | 0.000 | 119.835 |
| | 22318 | 36 | 1.298E-02 | 8.808E-02 | 6.808E+01 | | | | | | | |
| | 22361 | 16 | 2.022E-02 | -1.088E+00 | 3.948E+01 | | | | | | | |
| 121 | | | | | | 123.820 | -81.421 | 132.000 | -1.880 | 0.007 | 0.001 | 71.400 |
| | 22301 | 36 | 6.308E-02 | -3.098E-01 | 1.808E+02 | | | | | | | |
| | 22417 | 16 | 2.028E-02 | -1.888E+00 | 4.908E+01 | | | | | | | |
| 122 | | | | | | 9.298 | 30.007 | 37.878 | -0.020 | 0.018 | 0.000 | 403.878 |
| | 22307 | 36 | 8.718E-02 | 1.048E+00 | -4.078E+01 | | | | | | | |
| | 22448 | 16 | 3.748E-02 | -1.308E+00 | 8.448E+01 | | | | | | | |
| 120 | | | | | | 200.301 | -79.082 | 222.000 | -3.500 | 0.090 | 0.002 | 32.011 |
| | 22311 | 31 | 2.608E-02 | -2.128E+00 | 1.808E+02 | | | | | | | |
| | 22305 | 16 | 4.808E-02 | -1.008E+00 | 8.318E+01 | | | | | | | |
| 120 | | | | | | 348.500 | -180.032 | 300.200 | -8.800 | 0.187 | 0.002 | 15.100 |
| | 22308 | 36 | 9.208E-02 | -8.028E+00 | 3.328E+02 | | | | | | | |

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|---|---|---|---|
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| Approved by: | Date | | Report No. |

FORM LMSC 382 B-3

FORM LMSC 302 B-3

5.7 PANEL SPLICE ANALYSIS (CONT'D)

BAY 3 TO BAY 4 UPPER PANEL SPLICE FASTENER MARGINS OF SAFETY

LIFTOFF CONDITION

| A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GRID POINT | ELEM NUMBER | ANGLE [illegible] | [illegible] | [illegible] | AXIAL FORCE | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | M.S. |
| | | 0.017453 | V1 - ELD | V2 - ELD | P - ELD | | | | | | | |
| BAY 3 SIDE: | | | | | | | | | | | | |
| | 33401 | 10 | -3.60E-03 | 8.09E-01 | -1.43E+01 | | | | | | | |
| 110 | | | | | | -12.190 | -4.302 | 12.890 | 0.712 | 0.000 | 0.000 | 1702.000 |
| | 33399 | 30 | -9.04E-03 | -9.29E-02 | 8.84E-01 | | | | | | | |
| | 33402 | 10 | -2.74E-02 | 2.17E+00 | -2.01E+01 | | | | | | | |
| 120 | | | | | | 10.260 | -31.431 | 30.390 | 2.884 | 0.016 | 0.001 | 400.305 |
| | 33303 | 30 | -2.30E-02 | 2.84E-01 | 4.40E+01 | | | | | | | |
| | 33404 | 10 | -4.07E-04 | -2.72E+00 | -9.00E+01 | | | | | | | |
| 121 | | | | | | -84.140 | -19.081 | 87.090 | -59.140 | 0.000 | 0.000 | 24.000 |
| | 33341 | 30 | 0.87E-03 | 1.09E+00 | 4.09E+00 | | | | | | | |
| | 33471 | 10 | 0.99E-03 | 1.09E+00 | 9.30E+01 | | | | | | | |
| 122 | | | | | | -3.610 | 80.060 | 80.190 | 3.330 | 0.024 | 0.002 | 251.045 |
| | 33320 | 30 | 1.09E-02 | 1.77E+00 | -0.84E+01 | | | | | | | |
| | 33472 | 10 | -4.00E+00 | 0.73E-01 | 7.00E+01 | | | | | | | |
| 123 | | | | | | 43.000 | 30.690 | 67.017 | 2.712 | 0.000 | 0.001 | 242.077 |
| | 33300 | 31 | 0.71E-03 | 1.04E+00 | -4.07E+01 | | | | | | | |
| | 33390 | 10 | 2.72E-03 | -4.07E-01 | 2.00E+00 | | | | | | | |
| 130 | | | | | | -90.040 | 30.001 | 90.032 | 2.342 | 0.043 | 0.001 | 112.000 |
| | 33307 | 22 | 0.81E-03 | 2.04E+00 | -1.01E+00 | | | | | | | |
| BAY 4 SIDE: | | | | | | | | | | | | |
| | 40000 | 10 | 2.00E-02 | 9.01E-01 | -7.09E+01 | | | | | | | |
| 110 | | | | | | 10.040 | -70.703 | 77.400 | 0.097 | 0.022 | 0.000 | 103.730 |
| | 40004 | 30 | 1.72E-02 | 2.29E-01 | 0.74E+01 | | | | | | | |
| | 40006 | 10 | 0.00E+00 | -1.43E+00 | -1.17E+00 | | | | | | | |
| 120 | | | | | | 10.000 | -122.083 | 124.210 | -1.400 | 0.062 | 0.001 | 90.201 |
| | 40014 | 30 | 2.00E-02 | 2.44E-01 | 1.84E+00 | | | | | | | |
| | 40001 | 10 | 0.00E-02 | -1.30E+00 | -1.80E+01 | | | | | | | |
| 121 | | | | | | 10.400 | -176.400 | 178.272 | -2.071 | 0.070 | 0.001 | 47.000 |
| | 40021 | 30 | 4.30E-02 | -0.01E-01 | 2.00E+00 | | | | | | | |
| | 40077 | 10 | 1.11E-01 | -1.30E+00 | -2.23E+00 | | | | | | | |
| 122 | | | | | | 17.000 | -221.724 | 222.200 | 0.020 | 0.100 | 0.000 | 30.777 |
| | 40021 | 30 | 0.00E-02 | 1.41E+00 | 2.80E+00 | | | | | | | |
| | 40040 | 10 | 1.41E-01 | 0.40E-01 | -2.30E+02 | | | | | | | |
| 123 | | | | | | -90.290 | -292.230 | 212.740 | -0.290 | 0.000 | 0.000 | 29.024 |
| | 40015 | 31 | 7.00E-02 | -0.11E-01 | 2.40E+00 | | | | | | | |
| | 40000 | 10 | 0.00E-02 | 1.23E+00 | -2.71E+00 | | | | | | | |
| 130 | | | | | | 1.820 | -100.000 | 100.000 | 1.032 | 0.077 | 0.001 | 40.077 |
| | 40201 | 32 | 7.70E-02 | 4.03E-01 | 2.85E+00 | | | | | | | |

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| Approved by: | Date | | Report No. |

FORM LMSC 362 B-3

5.7 PANEL SPLICE ANALYSIS (CONT'D)

BAY 1 TO BAY 2 LOWER PANEL SPLICE FASTENER MARGINS OF SAFETY

LIFTOFF CONDITION

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GRID POINT | BAR NUMBER | ANGLE "PSI" | SIDE SHEAR | VERT. SHEAR | AXIAL FORCE | THETA FORCE | RADIAL FORCE | RES. SHEAR | TENSILE FORCE | SHEAR RATIO, Rs | TENSION RATIO, Rt | M.S. |
| 2 | | | 0.017453 | V1 - (LB) | V2 - (LB) | P - (LB) | | | | | | | |
| 3 | BAY 1 SIDE: | | | | | | | | | | | | |
| 4 | | 12343 | 33 | 7.36E-03 | 5.74E-01 | 6.82E+01 | | | | | | | |
| 5 | 105 | | | | | | 30.07 | 60.02 | 59.70 | 1.20 | 0.03 | 0.00 | 240.10 |
| 6 | | 12200 | 20 | 2.97E-02 | 6.00E-01 | -2.93E+01 | | | | | | | |
| 7 | | | | | | | | | | | | | |
| 8 | | 12342 | 20 | 1.33E-02 | 4.32E-02 | 9.02E+01 | | | | | | | |
| 9 | 107 | | | | | | 134.20 | 18.00 | 135.61 | 0.43 | 0.00 | 0.00 | 79.20 |
| 10 | | 12200 | 20 | 3.53E-02 | 3.00E-01 | 6.32E+01 | | | | | | | |
| 11 | | | | | | | | | | | | | |
| 12 | | 12340 | 20 | 1.77E-02 | -9.00E-01 | 1.12E+02 | | | | | | | |
| 13 | 106 | | | | | | 17.41 | 89.07 | 91.32 | -1.20 | 0.04 | 0.00 | 127.60 |
| 14 | | 12244 | 20 | -3.07E-02 | -3.00E-01 | -9.20E+01 | | | | | | | |
| 15 | | | | | | | | | | | | | |
| 16 | | 12337 | 20 | 2.00E-02 | -1.50E+00 | 1.30E+02 | | | | | | | |
| 17 | 105 | | | | | | 3.01 | 120.10 | 120.22 | -2.00 | 0.00 | 0.00 | 83.81 |
| 18 | | 12233 | 20 | 6.20E-02 | -1.30E+00 | -1.35E+02 | | | | | | | |
| 19 | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | |
| 21 | BAY 2 SIDE: | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | |
| 23 | | 22410 | 33 | 6.70E-02 | 2.00E-01 | -2.70E+01 | | | | | | | |
| 24 | 106 | | | | | | 22.07 | -30.73 | 43.11 | -0.20 | 0.02 | 0.00 | 300.40 |
| 25 | | 22257 | 20 | 2.01E-02 | -4.00E-01 | 5.03E+01 | | | | | | | |
| 26 | | | | | | | | | | | | | |
| 27 | | 22413 | 20 | 2.37E-02 | 6.37E-01 | -5.17E+01 | | | | | | | |
| 28 | 107 | | | | | | 21.04 | -52.23 | 66.00 | 0.32 | 0.04 | 0.00 | 142.41 |
| 29 | | 22240 | 20 | 3.10E-02 | -3.13E-01 | 1.00E+02 | | | | | | | |
| 30 | | | | | | | | | | | | | |
| 31 | | 22410 | 20 | 4.03E-02 | 8.20E-01 | -1.10E+02 | | | | | | | |
| 32 | 106 | | | | | | 6.20 | -107.32 | 107.51 | 0.00 | 0.00 | 0.00 | 90.02 |
| 33 | | 22234 | 20 | 4.07E-02 | 2.20E-02 | 1.20E+02 | | | | | | | |
| 34 | | | | | | | | | | | | | |
| 35 | | 22400 | 20 | 4.05E-02 | 8.15E-01 | -2.04E+02 | | | | | | | |
| 36 | 105 | | | | | | -45.04 | -150.42 | 163.00 | 1.00 | 0.07 | 0.00 | 53.00 |
| 37 | | 22224 | 20 | 3.57E-02 | 7.00E-01 | 1.53E+02 | | | | | | | |
| 38 | | | | | | | | | | | | | |
| 39 | | 22401 | 20 | 6.20E-02 | 1.04E+00 | -1.07E+02 | | | | | | | |
| 40 | 104 | | | | | | 60.45 | -120.10 | 142.00 | 2.72 | 0.00 | 0.00 | 64.00 |
| 41 | | 22210 | 20 | 3.00E-02 | 1.00E+00 | 1.01E+02 | | | | | | | |
| 42 | | | | | | | | | | | | | |
| 43 | | 22203 | 20 | 6.45E-02 | 9.70E-01 | 3.40E+01 | | | | | | | |
| 44 | 103 | | | | | | 202.00 | -112.02 | 313.02 | 3.41 | 0.13 | 0.00 | 10.32 |
| 45 | | 22201 | 20 | -3.57E-02 | 2.43E+00 | 2.01E+02 | | | | | | | |

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FORM LMSC 202 B-3

5.7 PANEL SPLICE ANALYSIS (CONT'D)

BAY 2 TO BAY 3 LOWER PANEL SPLICE FASTENER MARGINS OF SAFETY

LIFTOFF CONDITION

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GRID POINT | BAR NUMBER | ANGLE "PSI" | SIDE SHEAR | VERT. SHEAR | AXIAL FORCE | THETA FORCE | RADIAL FORCE | RES. SHEAR | TENSILE FORCE | SHEAR RATIO, Rs | TENSION RATIO, Rt | M.S. |
| 2 | | | 0.017453 | V1 - (LB) | V2 - (LB) | P - (LB) | | | | | | | |
| 3 | BAY 2 SIDE: | | | | | | | | | | | | |
| 4 | | 22343 | 33 | 1.03E-03 | 2.04E+00 | -3.00E+01 | | | | | | | |
| 5 | 105 | | | | | | -2424.88 | 1154.11 | 2686.56 | 2.78 | 1.18 | 0.00 | -0.18 |
| 6 | | 22205 | 20 | 0.00E-03 | 1.41E-01 | -2.07E+03 | | | | | | | |
| 7 | | | | | | | | | | | | | |
| 8 | | 22343 | 20 | 0.00E-03 | -2.17E+00 | -2.20E+01 | | | | | | | |
| 9 | 107 | | | | | | -25.04 | -0.02 | 20.53 | -4.88 | 0.01 | 0.00 | 300.30 |
| 10 | | 22250 | 20 | -3.43E-03 | -2.70E+00 | -0.51E+00 | | | | | | | |
| 11 | | | | | | | | | | | | | |
| 12 | | 22340 | 20 | -2.58E-03 | -1.92E+00 | -5.41E+00 | | | | | | | |
| 13 | 106 | | | | | | -0.21 | -4.07 | 4.07 | -4.78 | 0.00 | 0.00 | 448.43 |
| 14 | | 22244 | 20 | -7.42E-03 | -2.98E+00 | 5.17E+00 | | | | | | | |
| 15 | | | | | | | | | | | | | |
| 16 | | 22337 | 20 | -2.44E-03 | -2.00E+00 | 4.00E+00 | | | | | | | |
| 17 | 105 | | | | | | 15.00 | -3.30 | 15.00 | -3.30 | 0.01 | 0.00 | 500.51 |
| 18 | | 22233 | 20 | -4.73E-03 | -7.00E-01 | 1.25E+01 | | | | | | | |
| 19 | | | | | | | | | | | | | |
| 20 | | 22333 | 20 | 1.07E-03 | 0.42E-03 | 1.25E+01 | | | | | | | |
| 21 | 104 | | | | | | 32.72 | -5.00 | 33.00 | 0.30 | 0.01 | 0.00 | 507.48 |
| 22 | | 22223 | 20 | -1.55E-04 | 2.75E-01 | 2.30E+01 | | | | | | | |
| 23 | | | | | | | | | | | | | |
| 24 | | 22206 | 20 | 4.20E-03 | -7.50E-01 | 0.30E+01 | | | | | | | |
| 25 | 103 | | | | | | 86.74 | 13.30 | 87.70 | -3.41 | 0.04 | 0.00 | 132.83 |
| 26 | | 22207 | 20 | 7.04E-03 | -2.00E+00 | 3.30E+01 | | | | | | | |
| 27 | | | | | | | | | | | | | |
| 28 | BAY 3 SIDE: | | | | | | | | | | | | |
| 29 | | | | | | | | | | | | | |
| 30 | | 32410 | 33 | -1.51E-03 | 0.20E+00 | 7.32E+00 | | | | | | | |
| 31 | 106 | | | | | | -40.88 | 29.03 | 55.57 | 7.00 | 0.03 | 0.00 | 194.90 |
| 32 | | 32207 | 20 | -4.02E-03 | 1.30E+00 | -5.00E+01 | | | | | | | |
| 33 | | | | | | | | | | | | | |
| 34 | | 32413 | 20 | -0.55E-03 | -3.11E+00 | -1.20E+01 | | | | | | | |
| 35 | 107 | | | | | | -40.53 | 12.03 | 51.18 | -0.43 | 0.03 | 0.00 | 306.01 |
| 36 | | 32240 | 20 | -5.22E-03 | 2.00E+00 | -4.23E+01 | | | | | | | |
| 37 | | | | | | | | | | | | | |
| 38 | | 32410 | 20 | -1.03E-03 | 1.43E+00 | 2.10E+01 | | | | | | | |
| 39 | 108 | | | | | | 2.03 | 17.18 | 17.38 | 2.18 | 0.01 | 0.00 | 854.50 |
| 40 | | 32234 | 20 | 2.18E-03 | 0.79E-01 | -1.01E+01 | | | | | | | |
| 41 | | | | | | | | | | | | | |
| 42 | | 32400 | 20 | -0.01E-03 | -1.14E-01 | 3.50E+01 | | | | | | | |
| 43 | 105 | | | | | | 50.23 | 3.00 | 50.37 | -2.13 | 0.03 | 0.00 | 250.20 |
| 44 | | 32224 | 20 | -7.00E-03 | -2.01E+00 | 2.07E+01 | | | | | | | |
| 45 | | | | | | | | | | | | | |
| 46 | | 32401 | 20 | -0.40E-04 | -0.00E-01 | 2.70E+01 | | | | | | | |
| 47 | 104 | | | | | | 45.03 | 2.40 | 45.10 | -0.20 | 0.03 | 0.00 | 370.31 |
| 48 | | 32210 | 20 | -5.10E-03 | 3.31E-01 | 2.22E+01 | | | | | | | |
| 49 | | | | | | | | | | | | | |
| 50 | | 32203 | 20 | 4.02E-03 | 0.70E-01 | 4.50E+01 | | | | | | | |
| 51 | 103 | | | | | | 83.40 | -1.27 | 83.50 | 3.74 | 0.04 | 0.00 | 141.00 |
| 52 | | 32201 | 20 | -3.20E-03 | 2.70E+00 | 4.70E+01 | | | | | | | |

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Title AFE CARRIER VEHICLE STRESS ANALYSIS

Page 5.7.10 Form

Model AFE CV

Report No.

FORM LMSC 302 B-3

5.7 PANEL SPLICE ANALYSIS (CONT'D)

BAY 3 TO BAY 4 LOWER PANEL SPLICE FASTENER MARGINS OF SAFETY

LIFTOFF CONDITION

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 2 | | | 0.017453 | V1 - [illegible] | V2 - [illegible] | P - [illegible] | | | | | | | |
| 3 | BAY 3 SIDE | | | | | | | | | | | | |
| 4 | | 32343 | 35 | -1.32E-04 | 1.81E+00 | 1.83E+01 | | | | | | | |
| 5 | 106 | | | | | | -13.93 | 21.91 | 25.45 | 2.75 | 0.01 | 0.00 | 567.96 |
| 6 | | 32205 | 20 | 0.10E-03 | 1.00E+00 | -2.07E+01 | | | | | | | |
| 7 | | | | | | | | | | | | | |
| 8 | | 32343 | 20 | 0.30E-03 | 1.67E-00 | 1.40E+01 | | | | | | | |
| 9 | 107 | | | | | | -24.71 | 24.35 | 34.00 | 0.53 | 0.01 | 0.00 | 546.01 |
| 10 | | 32346 | 20 | 1.62E-03 | 5.00E-01 | -4.15E+01 | | | | | | | |
| 11 | | | | | | | | | | | | | |
| 12 | | 32345 | 20 | 1.70E-03 | 1.40E+00 | 0.04E+00 | | | | | | | |
| 13 | 108 | | | | | | -49.56 | 29.76 | 56.91 | 3.75 | 0.03 | 0.00 | 238.04 |
| 14 | | 32344 | 20 | 0.32E-03 | 2.24E+00 | -0.00E+01 | | | | | | | |
| 15 | | | | | | | | | | | | | |
| 16 | | 32337 | 20 | 1.42E-03 | 1.50E+00 | 2.50E+01 | | | | | | | |
| 17 | 109 | | | | | | -70.26 | 56.93 | 90.45 | 2.25 | 0.04 | 0.00 | 139.72 |
| 18 | | 32233 | 20 | 2.10E-03 | 0.70E-01 | -1.04E+02 | | | | | | | |
| 19 | | | | | | | | | | | | | |
| 20 | BAY 4 SIDE | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | |
| 22 | | 42418 | 35 | -5.72E-03 | -5.07E-01 | -2.36E+02 | | | | | | | |
| 23 | 105 | | | | | | -254.26 | -100.14 | 273.27 | -1.87 | 0.13 | 0.00 | 23.93 |
| 24 | | 42357 | 20 | -2.92E-03 | -1.30E+00 | -0.36E+01 | | | | | | | |
| 25 | | | | | | | | | | | | | |
| 26 | | 42413 | 20 | -2.10E-03 | -0.23E-01 | 0.62E+01 | | | | | | | |
| 27 | 107 | | | | | | -10.01 | 83.35 | 84.84 | -0.07 | 0.04 | 0.00 | 142.75 |
| 28 | | 42246 | 20 | -4.54E-03 | -4.53E-01 | -1.04E+02 | | | | | | | |
| 29 | | | | | | | | | | | | | |
| 30 | | 42416 | 20 | 1.00E-03 | -0.36E-01 | 4.01E+01 | | | | | | | |
| 31 | 108 | | | | | | -69.13 | 78.74 | 103.25 | -1.25 | 0.04 | 0.00 | 100.83 |
| 32 | | 42234 | 20 | -2.09E-03 | -0.47E-01 | -1.20E+02 | | | | | | | |
| 33 | | | | | | | | | | | | | |
| 34 | | 42406 | 20 | -2.36E-03 | -7.00E-01 | 0.03E+00 | | | | | | | |
| 35 | 109 | | | | | | 141.86 | -63.19 | 155.39 | -1.45 | 0.07 | 0.00 | 57.86 |
| 36 | | 42224 | 20 | -2.00E-03 | -0.55E-01 | 1.51E+02 | | | | | | | |
| 37 | | | | | | | | | | | | | |
| 38 | | 42401 | 20 | -5.15E-03 | -0.00E-01 | -1.03E+02 | | | | | | | |
| 39 | 104 | | | | | | -303.77 | 57.81 | 309.22 | -1.25 | 0.13 | 0.00 | 10.75 |
| 40 | | 42215 | 20 | -5.74E-03 | -0.00E-01 | -2.36E+02 | | | | | | | |
| 41 | | | | | | | | | | | | | |
| 42 | | 42203 | 20 | -7.77E-03 | -1.00E+00 | -1.52E+02 | | | | | | | |
| 43 | 105 | | | | | | -414.25 | 60.79 | 419.07 | -7.35 | 0.15 | 0.00 | 12.07 |
| 44 | | 42201 | 20 | 3.00E-03 | -5.48E+00 | -3.00E+02 | | | | | | | |

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Title AFE CARRIER VEHICLE STRESS ANALYSIS

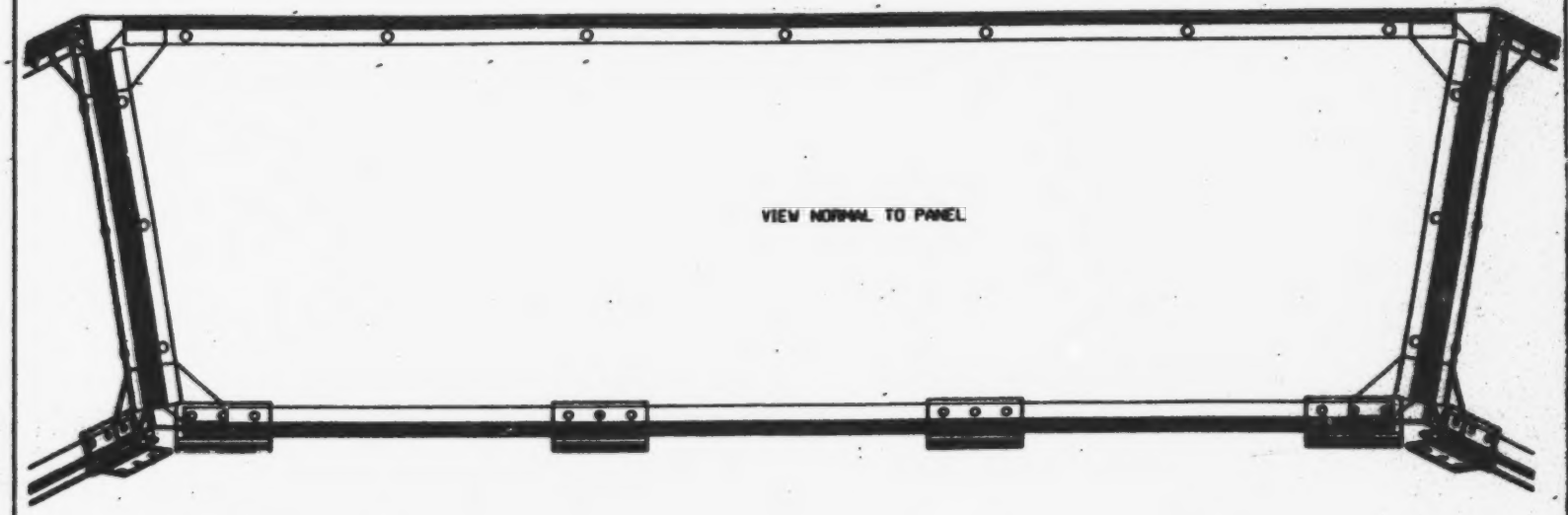
Page 5.7.11 Total Form

Model AFE CV

Report No.

5.8 AVIONICS PANEL ANALYSIS

- HINGE AND ATTACH BOLT LOCATIONS

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Title AFE CARRIER VEHICLE STRESS ANALYSIS

Model

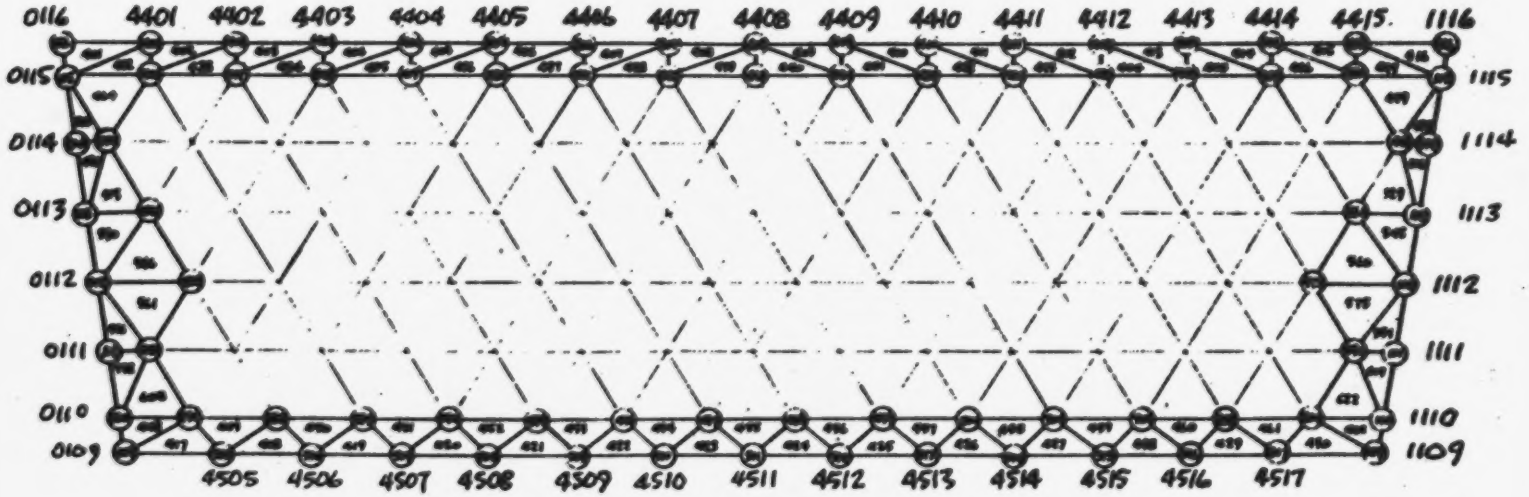
Report No.

Page 5.8.1

FORM LMSC 202 8-3

## 5.8 AVIONICS PANEL ANALYSIS (CONT'D)

PANEL PLATE (CTRIA2) ELEMENTS RESPECIFIED TO "FREE" NODES ~ NOT COMMON TO RADIAL BEAM, UPPER & LOWER PANELS EXCEPT THROUGH SPRING (CELAS2) ELEMENTS AT FASTENER LOCATIONS.

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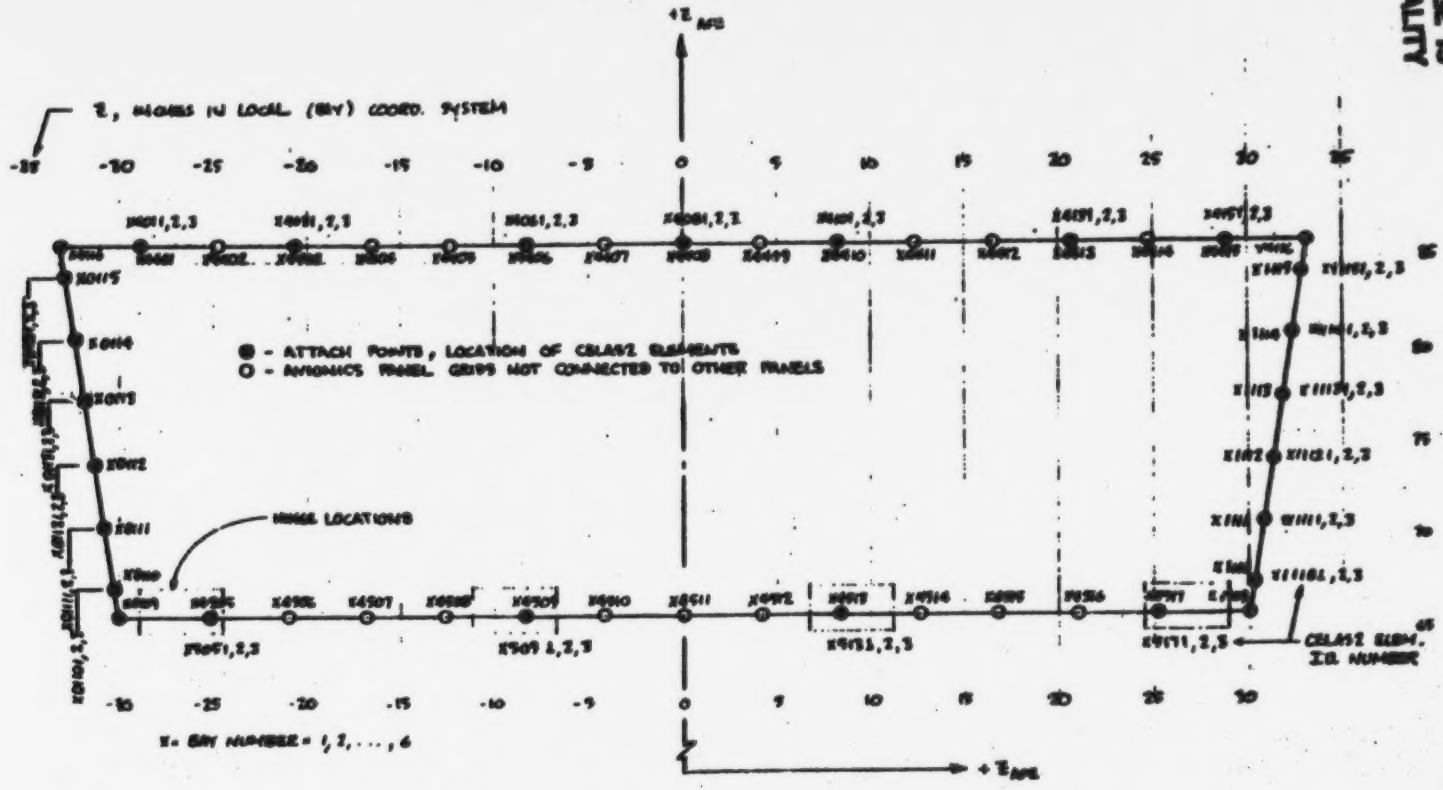
Title: AFT CARRIER VEHICLE STRESS ANALYSIS
Dept. Page 5.8.2
Model
Report No.

FORM LMSC 202 6-8

## 5.8 AVIONICS PANEL ANALYSIS (CONT'D)

- REVISED NASTRAN MODEL SHOWING AVIONICS PANEL ATTACHMENTS

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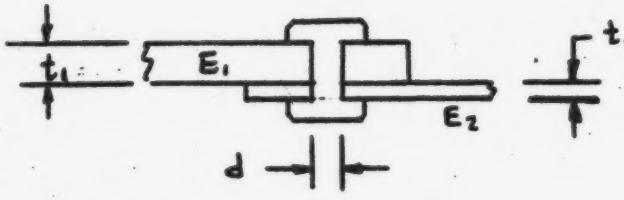
| Checked by: | Date | Title AFE CARRIER VEHICLE STRESS ANALYSIS | Model |
| Approved by: | Date | | Report No. |

## 5.8 AVIONICS PANEL ANALYSIS

ATTACH BOLT STIFFNESS CALCULATIONS

FASTENER FLEXIBILITY $c = \frac{1}{k}$

FROM ⚠: $c = \left(\frac{t_1+t_2}{2d}\right)^a \cdot \frac{b}{n}\left(\frac{1}{t_1E_1} + \frac{1}{nt_2E_2} + \frac{1}{nt_1E_3} + \frac{1}{2nt_2E_2}\right)$




$a = \frac{2}{3}$, $b = 3$ FOR BOLTED METALLIC JOINT (CURVE FIT PARAMS.)

$n = 1$ FOR SINGLE SHEAR

FOR $\frac{1}{4}$" STEEL BOLT IN ALUMINUM STRUCTURE:

$$c = \left(\frac{t_1 + .125}{2(.25)}\right)^{2/3} \cdot \frac{3}{1\cdot10^6}\left(\frac{1}{t_1(10)} + \frac{1}{.125(10)} + \frac{1}{t_1(30)} + \frac{1}{2(.125)(30)}\right)$$

$$c = \left(\frac{t_1 + .125}{.50}\right)^{2/3} \cdot 3\times10^{-7}\left(\frac{1}{t_1} + \frac{1}{3t_1} + \frac{1}{.125} + \frac{1}{6(.125)}\right)$$

$$c = \left(\frac{t_1 + .125}{.50}\right)^{2/3} \cdot 3\times10^{-7}\left(\frac{4}{3t_1} + 9.333\right)$$

| PANEL 4 THICKNESS, $t_1$ | FLEXIBILITY, c | STIFFNESS k |
|---|---|---|
| .25 | $3.632\times10^{-6}$ | $2.753\times10^{5}$ |
| .40 | $3.926\times10^{-6}$ | $2.547\times10^{5}$ |
| .45 | $4.049\times10^{-6}$ | $2.470\times10^{5}$ |
| .50 | $4.177\times10^{-6}$ | $2.394\times10^{5}$ |

⚠ REF: THE INFLUENCE OF FASTENER FLEXIBILITY ON THE PREDICTION OF LOAD TRANSFER AND FATIGUE LIFE FOR MULTI-ROW JOINTS - Dr. H. HUTH